September, 1950
40 Cents
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QST

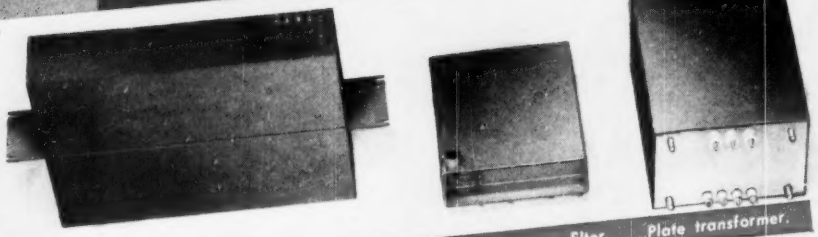
devoted entirely to

amateur radio

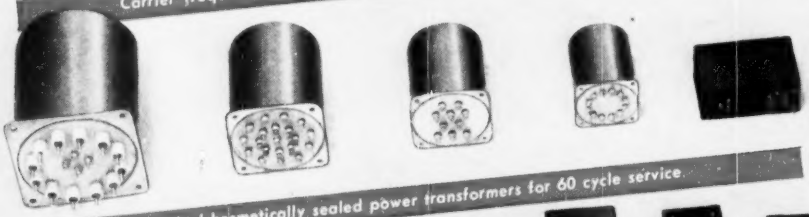
In This Issue — **CRYSTAL-CONTROLLED CONVERTERS FOR 10, 6 AND 2**

UTC for Military Components

UTC was the largest supplier of transformer components in World War II. Present UTC production is on a similar basis. Illustrated below are a few of the thousand military types in UTC 1950 production.

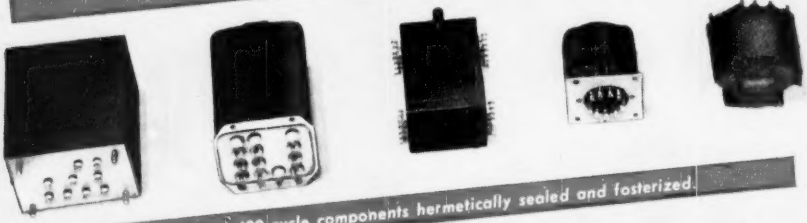


Carrier frequency filter..... Aircraft low frequency filter..... Plate transformer.



Typical hermetically sealed power transformers for 60 cycle service.

Hermetically sealed audio and pulse transformers.



60 cycle and 400 cycle components hermetically sealed and fosterized.

Miniaturized audio units, magnetic amplifiers, etc.

United Transformer Co.

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RIGHT NOW, in all likelihood, your home is protected by "prowl cars" relying on the widely used GL-2E26 for assured radio contact with headquarters. Here's steady performance that brands this fine G-E tube "EXTRA-RELIABLE." Plug it in your new mobile rig with confidence!

For work above 30 mc, the GL-2E26—up-to-the-minute in concept and design—is definitely as good as they come . . . and lower, much lower, in price than most. You can buy *three* GL-2E26's—one for driver, plus a pair for push-pull final—for less than you'd pay for one standard 50-watter!

And the tube has power! At right is mention of a small mobile rig that will bring you plenty of QSO's while you're driving along . . . which uses a single GL-2E26 for final. Up to 40 w CW and 27 w phone: these are the tube's substantial input ratings.

Also, low grid-to-plate capacitance makes the GL-2E26 easy to apply and operate. And (neatly circumventing a common v-h-f problem) shielding is handled by a short metal sleeve which so surrounds the tube's input that no external shield is required.

Visit your G-E tube distributor to inspect the GL-2E26, and learn the economy price. Or write *Electronics Department, General Electric Company, Schenectady 5, New York.*

GL-2E26
V-h-f Beam Power Tube

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Heater voltage	6.3 v
current	0.8 amp
Max plate voltage	600 v
Max screen voltage	200 v
Max plate input	40 w
Max plate dissipation	13.5 w

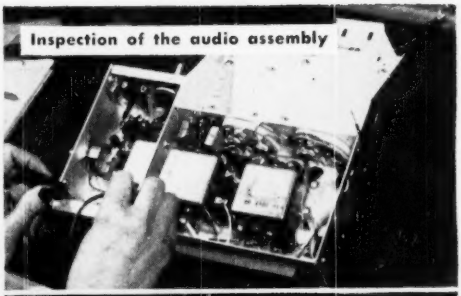
● **MARCH-APRIL *HAM NEWS*** featured a simple emergency-portable rig with a GL-2E26 for the final stage, small enough so you can tuck the unit in the glove compartment of your car! For CW, the whole bag of tricks is compactly housed in a 4-by-5-by-6-inch metal box. If you want phone, May-June *Ham News* told you how to build the companion modulator. However . . . this is a low-frequency 70-80 meter rig, so is no yardstick of the GL-2E26's ability to operate up to 125 mc at max input, in transmitters designed for v-h-f.

ELECTRONIC TUBES OF ALL TYPES FOR THE RADIO AMATEUR

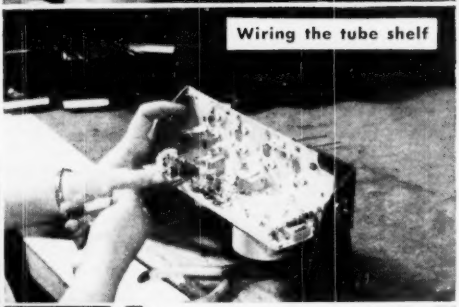
GENERAL ELECTRIC

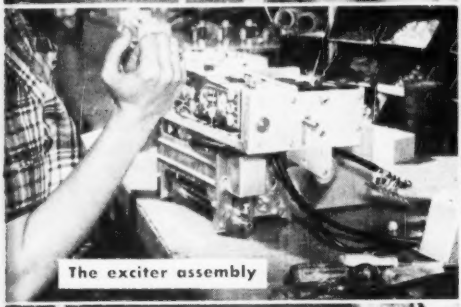
160-JA5

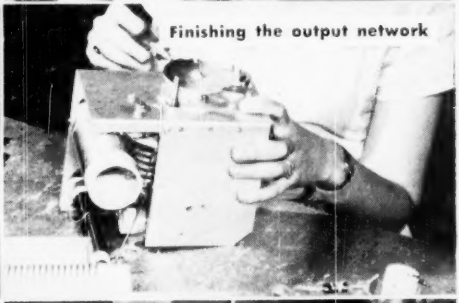
The Collins 32V-2 amateur transmitter is designed, assembled, inspected and tested with the same skill and care as the best military radio equipment

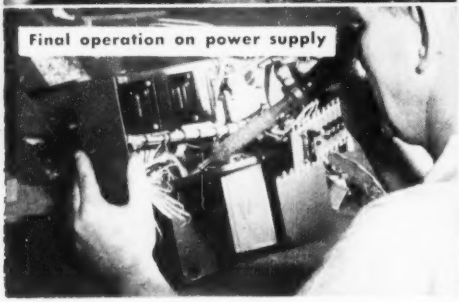

Inspection of the audio assembly

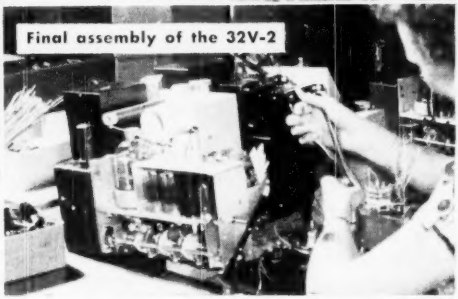
Slide rule and vernier dial unit


Wiring the tube shelf


The exciter assembly


Finishing the output network


Final operation on power supply


Final assembly of the 32V-2

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QST

SEPTEMBER 1950

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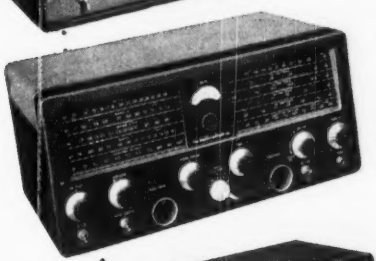

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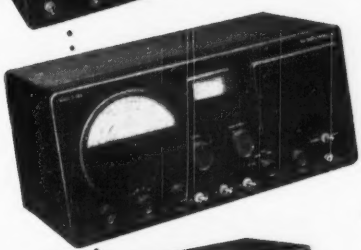

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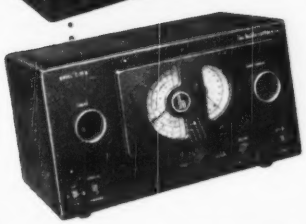

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

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Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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Moorhead, Minn.
Alternate:

Delta Division

VICTOR CANFIELD W5BSR
P. O. Box 965, Lake Charles, La.
Alternate: George S. Acton W5BMM
Plain Dealing, La.

Great Lakes Division

JOHN H. BRABB W8SPF
417 Ford Bldg., Detroit 26, Mich.
Alternate: Harold E. Stricker W8WZ
247 W. 5th St., Marysville, Ohio

Hudson Division

JOSEPH M. JOHNSTON W2SOX
423 Monmouth Ave., Bradley Beach, N. J.
Alternate: Gay E. Millus, jr. W2NJF
170 Broadway, New York 7, N. Y.

Midwest Division

LEONARD COLLETT . . . . . WØDEA
Civil Aeronautics Administration
Box 776, Joplin, Mo.
Alternate: Alvin G. Keyes . . . . . WØKTQ
1201 Merchants Nat'l Bank Bldg., Cedar Rapids, Ia.

New England Division

PERCY C. NOBLE W1BVR
37 Broad St., Westfield, Mass.
Alternate: Clayton C. Gordon W1HRC
70 Columbia Ave., Providence 5, R. I.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.
Alternate: Allan D. Gunston W7GP
1033 Salem Ave., Apt. 4, Dayton 6, Ohio

Pacific Division

KENNETH E. HUGHES W6CIS
810 W. Orange Ave., So. San Francisco, Calif.
Alternate: C. Porter Evans W6BF
134 Dracena Ave., Piedmont 11, Calif.

Roanoke Division

J. FRANK KEY W4ZA
Box 707, Buena Vista, Va.
Alternate: Gus M. Browning W4BPD
135 Broughton St., S. E., Orangeburg, S. C.

Rocky Mountain Division

FRANKLIN K. MATEJKA . . . . . WØDD
P. O. Box 212, Estes Park, Colo.
Alternate: William R. White . . . . . WØPDA
1263 Pearl St., Denver 3, Colo.

Southeastern Division

LAMAR HILL W4BOL
104 Myrtle, Cochran, Ga.
Alternate: William P. Sides W4AUP
Fleming Road, Montgomery, Ala.

Southwestern Division

JOHN R. GRIGGS W6KW
10412 Don Pico Rd., RFD 2, Spring Valley, Calif.
Alternate: John E. Bickel W6NY
2111 Edgewood Ave., Las Vegas, Nev.

West Gulf Division

DAVID H. CALK W5BHO
7730 Joplin St., Houston 17, Texas
Alternate:

"It Seems to Us..."

MOBILIZATION

The United States has begun small-scale mobilization because of the decision of the United Nations in the Korean situation. This will affect the personal lives of many of us, because it is a precept of the amateur that he forms a reservoir of trained personnel against the event of emergency. Those of us in military reserves may receive calls to active duty; those in industry will find stepped-up production schedules making the 40-hour week temporarily a thing of the past; those on the home front will be gearing for participation in civilian defense communications plans as they materialize. Whatever your part in communications as an amateur, carry it through in the highest traditions of the amateur fraternity.

We hear an occasional rumor that amateur radio may soon be shut down. At this moment of writing (July 28th), it is purely rumor. Should the U. S. become involved in total war, certainly there will be considerable restriction of normal amateur activities with probable shutdown except for bands in which authorities may decree we can operate to furnish wartime auxiliary communications services. Since no one knows exactly the nature of the services which may be needed, no one knows what frequencies may be involved. Your League officers are in close touch with Washington in this matter and will be consulted in connection with any steps affecting us. At this writing, however, there are no restrictions of any kind in operation or in contemplation for amateur radio.

But watch your conversations on the air, especially with voice. Steer clear of discussions about developments in the international situation; let the newspapers do that. Don't talk about your job or changes in it if at all related to mobilization. Confine international contacts strictly to technical matters and small talk. Let's have no incidents which might cause unfavorable comment.

About the time this issue appears, it is expected that at least a preliminary plan will be issued by the National Security Resources Board for civilian defense preparations.[1] This will permit amateurs who have been standing by with emergency communications plans to follow through with their municipal authorities to tie in amateur facilities in accord with the over-all plan. It is a move we have been awaiting, for it will furnish the opportunity to demonstrate again the services we can perform. Every amateur should make the most of it; the first step is to be registered with your local Emergency Coördinator. Write your SCM if you do not know his name.

1950-STYLE

Have you heard that gang of s.s.b. stations around 3999 kc. working rapid break-in? If you haven't, you're really missing something. They use voice-controlled transmitters and receivers, so they don't throw any switches manually to transmit or receive. The result is a real ear-opener. Actually, it's the closest thing to a bunch of fellows getting together at a hamfest or the club that ham radio has ever had, and it makes the old monologue-style 'phone QSOs sound like something out of the dark ages. These fellows don't need any "master of ceremonies" or "net control" station — he couldn't keep up with them anyway.

Of course you don't have to use s.s.b. to enjoy some of the advantages of voice break-in operation — the lads with controlled-carrier and voice-operated relays can come close to duplicating it, although they generally lose out when more than one station is transmitting at the same time on the same frequency. On s.s.b. the carriers are held down to practically nothing, and you can copy several stations on the same frequency at the same time, if you're good at picking out voices. Roll your receiver up to the frequency some evening and do a little eavesdropping — we think you will be as envious as we are.

This technique wasn't a bonus of s.s.b. The gang worked for it. In the traditional ham manner they discussed it on the air, tried out a lot of circuits, and they still argue as to the best methods. But now they have something, an operating technique that we think is worthy of 1950-style amateur radio.

[1] See p. 25 this issue.

Disaster Communications Service Rules Proposed

In early August FCC issued a Notice of Proposed Rule Making to set up a Disaster Communications Service in the frequency band 1750–1800 kc., as a culmination of proceedings started toward that end in its 1944 hearings, and more specifically provided for in the revised Part 2 of its regulations which became effective July 1, 1949.

It is proposed that the service be set up to "provide communications in connection with disasters and other incidents involving loss of communications facilities beyond those normally available." A primary use of the frequencies will be for liaison between established individual or network stations handling disaster communications on their own regularly-assigned frequencies, although applications will be considered from groups not now having radio facilities. Authorization will be granted only to applicants who demonstrate that they are an integral part of a locally-coördinated disaster plan. Any presently-licensed station (including amateurs) thus eligible may be authorized to operate in the disaster service upon the filing of a notarized letter of application plus satisfactory proof of integration with the local disaster plan.

Assigned call letters of presently-licensed stations will be used also in the new service. Communication in the DCS may take place only when competent local authority determines that a pending or actual disaster warrants activation, or when he schedules training operations and tests. The competent local authority is the head of the disaster communications plan or the individual in charge of the net control station.

Organization of the service will be left largely to local groups interested in providing such service. It is obvious that heavy reliance is to be placed on amateurs; for example, amateur operator licenses are valid for use in DCS. So are commercial licenses, but only within the terms of authority granted.

From 1750 to 1765 kc. there are 15 one-kc. c.w. channels; there is then a Scene of Disaster channel 7 kc. wide, 1765–1772 kc., available for voice or c.w.; then four 7-kc. voice channels, 1772 to 1800 kc. Frequency tolerance is 0.005 per cent and rather strict attenuation figures for harmonic and spurious emissions are proposed.

This is the culmination of a long effort, and at least in part results from the request of the League back in 1945 urging the establishment of such a service in 1750–1800 kc. It will provide the tools whereby the work of amateurs in disaster communications may be expanded and, perhaps more important, coördinated with that of police, fire, utilities, etc. It is not intended specifically as a civilian defense measure, though of course at the present time a great deal of use will be made of the service by the present gearing to defense needs.

Note that this service has not been established but only proposed. Comments on the proposed rules may be filed by September 15th.

More next month.

September 1925

. . . Greater emphasis on straightforward low-loss receiving circuits — not "pseudodynes" — is urged by William H. Adams.

. . . Methods of adding regeneration to the popular Hazeltine neutrodyne receiver, thereby improving signal strength and sensitivity, are detailed by Assistant Traffic Manager A. L. Budlong.

. . . Amateur transmissions are a minority factor in causing interference to broadcast reception, according to investigations by prominent utility companies.

. . . Stray r.f. in the neighbors' housewiring can be eliminated by connecting small by-pass condensers across the line, reports Malcolm H. Romberg.

. . . By following the simple conversion outlined by W. H. Raring, 8LH, discarded trolley car ventilating motors can be made into synchronous converters for supplying 1100 volts d.c. plate supply.

. . . The master-oscillator power-amplifier rig behind the stable chirpless signal from 9EK is described by W. H. Hoffman. Type UV-202 tubes with battery plate supply are used.

. . . Eugene C. Woodruff, 8CMP, describes a practical Lecher Wire system for accurately measuring short waves.

. . . Lieut. Fred H. Schnell reports via a2CM-u6CGW that equipment breakdowns have temporarily interrupted the short-wave tests from the U.S.S. *Seattle*. Ed Willis, 6TS, is operating a similar station aboard the U.S.S. *Relief*, also participating in the Pacific cruise of the Fleet.

. . . New apparatus announcements herald "precision" 10-per-cent accuracy molded-bakelite capacitors by Sangamo, "midget" low-minimum-capacity variable condensers by Hammarlund, and a metalized glass-filament grid leak by Durham.

. . . The following have been named Canadian division managers: W. M. Sutton, c3NI, Ontario; W. R. Pottle, c4PA, Winnipeg; and William Rowan, c5GF, Vancouver.

. . . Well-known stations described this month are Paul G. Watson's 4ZD-4XX, Savannah, Ga., B. J. Kroger's 3APV, Chevy Chase, Md., and 8ZE-8GX, Oberlin College, Ohio.

. . . For code practice, a vacuum-tube audio oscillator is to be preferred over a buzzer, states William S. Halstead, president of the Haverford (Penna.) College Radio Club. His working model uses a "hard" 201-A.

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W1GHI, Ray C. MacGinnis, Stratford, Conn.
Ex-W1HUN, Myron A. Tong, Quincy, Mass.
W1MRN, Leroy P. Mansfield, Wolfeboro, N. H.
W2ARU, ex-W5JFN, Fred A. Nield, New York City
W2EPQ, Sandford Major, Williston Park, L. I., N. Y.
W2NBS, George E. White, Jersey City, N. J.
W2NFD, Harry Hayward, Newburgh, N. Y.
W3BQ, Herbert M. Walleze, Baltimore, Md.
W3KTL, Frank E. Sovek, Pittsburgh, Penna.
W3OG, Dr. John H. Leighner, Butler, Penna.
W4RZ, Millard S. Alexander, Atlanta, Ga.
W5CWB, Leon W. McCreight, Irving, Texas
Ex-W7CSF, Richard Rose, Everett, Wash.
W7FYA, Glenn A. Perkins, Kalispell, Mont.
W9EEL, John D. Wilkinson, Waukesha, Wisc.
GM3DBS, Robert Smith, Glasgow
VK7XA, C. E. Oldham, New Town, Tas.

Crystal-Controlled Converters for V.H.F. Use

An Improved Receiving System for 28, 50 and 144 Mc.

BY EDWARD P. TILTON,* WIHDQ, AND C. VERNON CHAMBERS,** WIJEQ

In building a multiband receiving device for v.h.f. use one soon discovers that conventional methods of band changing leave much to be desired. Plug-in coils or the best available bandswitches build up circuit capacitance beyond that tolerable for 144-Mc. work, and by-passing and coupling problems multiply when more than one band is attempted with a single tube and circuit line-up.

A plug-in r.f. unit is usually the next consideration, but this becomes an unwieldy project if tunable oscillators are used. A crystal-controlled oscillator and a fixed-tuned front end (r.f. amplifiers and mixer) simplify the mechanical and electrical problems involved, and make it possible to design tuned circuits that will be at maximum effectiveness for each frequency range desired. Tuning over the band is then, of course, done at the intermediate frequency, with the receiver with which the converter is to be used.

This approach has other obvious advantages. It is difficult to build a satisfactory degree of stability into a tunable v.h.f. converter, even if it is designed for one band. We have gotten along for years with makeshifts, the unsatisfactory nature of which is never fully realized until one has used crystal-controlled receiver oscillators for a while. It is axiomatic that the best signal-to-noise ratio can be achieved only with narrow-band techniques; it is when we try to squeeze the i.f. passband down to crystal filter proportions that we become acutely conscious of the shortcomings of even the best tunable v.h.f. oscillators. The three-band converter system shown here was designed for optimum performance at 28, 50 and 144 Mc., within the limitations of amateur receiver technique, yet the cost and complexity are held to reasonable proportions.

Basically the converter is made up of two units, each on a standard-size chassis. The base unit contains the power supply, i.f. amplifier stage, gain control, and all other parts that need not be changed in moving from one band to another. The r.f. assemblies are complete front ends, one for each band, arranged to plug into the base unit in one simple motion. Connections to the power supply and the i.f. amplifier are made through a 4-prong plug at the rear of the r.f. chassis. This plug-in construction holds down the physical size of the system, and permits building one or more of the r.f. sections, as needed.

Front-End Design

In the interest of low noise figure and broad response, the now-familiar cascode[1] circuit is used in the converters for 28 and 50 Mc. A glance at the circuit diagram, Fig. 1, and the photographs will show that these two units are practically identical, except for the factors governing frequency. A triode-connected 6AK5 with inductive neutralization works into a 6J6 grounded-grid amplifier. The functions of crystal-controlled oscillator and mixer are combined in another 6J6. The mixer plate circuit is included in the plug-in unit.

A similar circuit arrangement could have been used effectively for 144 Mc., but the push-pull 6J6 set-up was selected because it gave promise of

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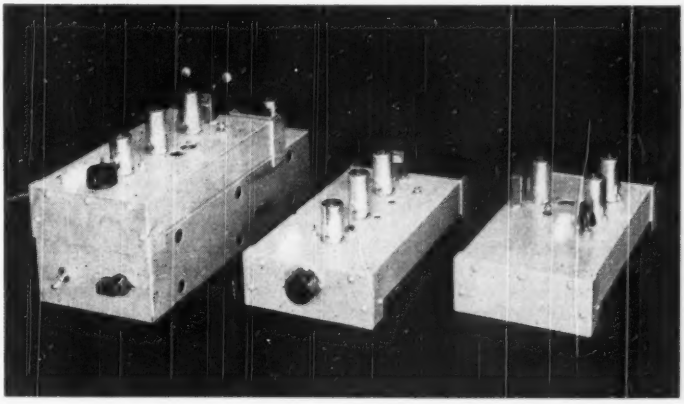
** Technical Assistant, *QST*.

[1] Wallman, Macnee and Gadsen, "A Low-Noise Amplifier," *Proc. I.R.E.*, June, 1948.



Crystal-controlled converters for 28, 50 and 144 Mc. At the left the 50-Mc. unit is seen mounted on the base. The latter includes an i.f. amplifier and power supply. The 28-Mc. converter (center) is similar mechanically and electrically to the 50-Mc. one. At the right is the 144-Mc. plug-in unit.

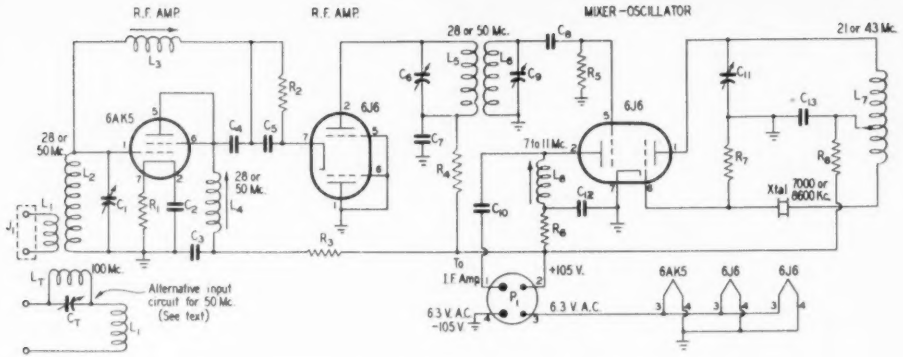


Fig. 1 — Schematic diagram of the crystal-controlled converters for 28 and 50 Mc. Unless otherwise indicated, parts are the same for both units.

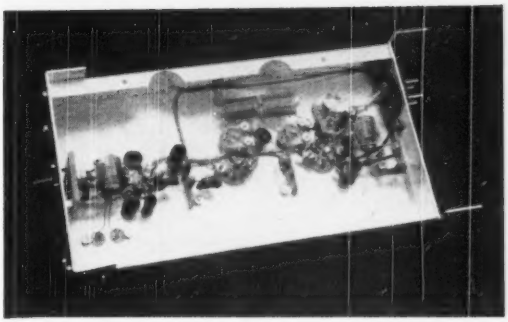
C_1 — 15-$\mu\mu$fd. variable (Millen 20015).
C_2, C_3, C_7, C_{12}, C_{13} — 0.005-μfd. disc ceramic.
C_4, C_8, C_{10} — 50-$\mu\mu$fd. ceramic.
C_5 — 500-$\mu\mu$fd. ceramic.
C_6, C_9 — 5–20-$\mu\mu$fd. ceramic trimmer.
C_{11} — *50 Mc.:* 50-$\mu\mu$fd. air trimmer (Millen 26050). *28 Mc.:* 75-$\mu\mu$fd. air trimmer (Millen 26075).
R_1, R_2 — 100 ohms, ½ watt.
R_3, R_4, R_6, R_8 — 1000 ohms, ½ watt.
R_5 — 0.68 megohm, ½ watt.
R_7 — 3300 ohms, 1 watt.
L_1 — 4 turns No. 28 e. between turns of L_2 at cold end.
L_2 — *50 Mc.:* 10 turns No. 20 tinned, ½-inch diam., ⅝ inch long (B & W Miniductor 3003). *28 Mc.:* 14 turns No. 20 tinned, ⅝-inch diam., ⅞ inch long (B & W Miniductor 3007).
L_3 — *50 Mc.:* 25 turns No. 32 e., close-wound on CTC LSM form (¼-inch diam., slug-tuned). *28 Mc.:* CTC LS3 10-Mc. coil, slug-tuned.
L_4 — *50 Mc.:* Slug-tuned plate coil CTC LS3 30 Mc. *28 Mc.:* CTC LSM 10-Mc. coil with 4 turns removed, slug-tuned.
L_5, L_6 — *50 Mc.:* 8 turns No. 18 tinned, ⅝-inch diam., 1 inch long (B & W Miniductor 3006), ¼ inch space between cold ends. *28 Mc.:* 9 turns No. 24 tinned, ½-inch diam., 9/32 inch long (B & W Miniductor 3004), 3/16 inch space between cold ends.
L_7 — *50 Mc.:* 10 turns No. 20 tinned, tapped 3½ turns from crystal end (B & W Miniductor 3003), ½-inch diam., ⅝ inch long. *28 Mc.:* 10 turns No. 20 tinned, ⅝-inch diam., ⅞ inch long, tapped 3½ turns from crystal end (B & W Miniductor 3007).
L_8 — CTC LS3 5-Mc. coil with 7 turns removed.
L_T, C_T — F.m. trap. 7 turns No. 20 tinned, ½-inch diam., ⅜ inch long (B & W Miniductor 3003), tuned with 5–20-$\mu\mu$fd. ceramic trimmer.
J_1 — Crystal socket for antenna terminals.
P_1 — 4-prong male plug.

approximately the same performance as the cascode at this frequency, but with one less tube. The push-pull circuits have the added advantage of being inherently balanced. If coaxial line is used in the antenna system the single-ended input circuit of the cascode amplifier would be preferable. Should the constructor wish to use such an arrangement the circuit would be similar to that of Fig. 1, and information on parts values can be found in the 1950 edition of *The Radio Amateur's Handbook*, Fig. 12-7.

Where an oscillator of fixed frequency is used and the intermediate frequency is made variable, special problems arise that are not encountered with the more common fixed-i.f. and variable-oscillator arrangement. The front-end circuits must be made broadband, to reduce the need for adjusting them as the i.f. is varied. This broadband characteristic increases the likelihood of interference from stations operating in the intermediate-frequency range. When the i.f. is left on one channel we select a frequency that is free of interference; if unwanted signals appear it is merely necessary to shift the i.f. slightly. With the crystal-controlled converter, the system must be capable not only of responding to a band four megacycles wide, but it must be able to reject signals on all frequencies other than the desired r.f. ranges.

The response curves of the converters are such that little change in gain is noticed in tuning across any of the bands. This is achieved through the use of overcoupled circuits between the r.f. and mixer stages, and by slug-tuned coils in the mixer and i.f. amplifier plate circuits that are resonated by the tube and circuit capacitance only. The mixer plate winding, L_6, in the 2-meter converter is loaded by R_4 to broaden the over-all response further. In all three converters the only adjustment required in covering the bands is a slight repeaking of the input circuit of the r.f. amplifier. This is not critical, however, and it is probable that the selectivity of the antenna system will account for more variation in response across the band than will the converter circuits themselves.

Interference from stations operating in the 7- to 11-Mc. range is reduced by the use of a bandpass coupling circuit (L_5-C_6, L_6-C_9 in Fig. 1) between the second r.f. and the mixer in the converters for 28 and 50 Mc. This coupling system provides good transfer at the signal frequency, and fairly high rejection in the i.f. range. Using conventional coupling initially we ran into trouble with i.f. interference, and the bandpass system was found to be necessary. The inductive coupling in the 2-meter converter serves a similar purpose.



Bottom view of the 28-Mc. plug-in unit. At the left is the tuned input circuit, followed by the 6AK5 r.f. stage, with its slug-tuned plate and neutralizing windings. At the middle of the chassis is the 6J6 grounded-grid stage, with its bandpass coupling to the mixer grid. Oscillator components are at the upper right. Parts arrangement in the 50-Mc. converter is similar.

Selection of Crystal Frequencies

A wide variety of crystal and intermediate frequencies can be used if only one band is to be covered with a crystal-controlled converter, but the choice narrows down in a multiband job. It is desirable that all bands start at the same receiver dial setting, and the crystal frequencies should be chosen so that they will be obtainable readily from dealers' stocks, or on order with a minimum of delay. A workout with a slide rule and some crystal manufacturers' catalogs resulted in the solution shown in Table I.

TABLE I

CRYSTAL AND MULTIPLIER DATA FOR CRYSTAL-CONTROLLED CONVERTERS

Band (Mc.)	*Crystal (Mc.)*	*Overtone*	*Injection Freq. (Mc.)*	*I.F. Range (Mc.)*
28 – 29.7	7.0	3rd	21	7 – 8.7
50 – 54	8.6	5th	43	7 – 11
144 – 148	6.8	5th × 4	137	7 – 11

Low-cost crystals are used in a regenerative triode oscillator circuit,[2] working on an odd overtone of the crystal frequency. In the 28-Mc. converter a 7000-kc. crystal oscillates on its third overtone. Fifth-overtone operation of an 8600-kc. crystal furnishes the injection voltage in the 50-Mc. unit. A 6800-kc. crystal oscillates on its fifth overtone in the 144-Mc. converter, the frequency being multiplied again by 4 in the second 6J6 triode section. Note the term "overtone" — in this circuit the frequency on which the crystal oscillates is not necessarily an exact multiple of the marked frequency. It is close enough for ordinary calibration purposes, however; there was less than 100 kc. discrepancy at 137 Mc. in the 2-meter job, even after the 20 times multiplication of the crystal frequency. The difference from the multiple of the marked frequency in the other two units is hardly noticeable.

Harmonic-type crystals might have been used, but the desired frequencies were not readily available, and the cost would have been materially higher. Conventional operation of lower-frequency crystals, making up the multiplication with additional stages, is not recommended because of the difficulty in avoiding numerous birdies from crystal harmonics. In the circuit shown no frequency lower than the overtone at which the crystal oscillates can be heard.

[2] For more information on the regenerative triode oscillator, see "So It's Hard To Get on V.H.F.!" *QST*, November, 1948, p. 44.

Layout

The units are built on aluminum chassis of stock sizes. The base is 3 by 5 by 13 inches (ICA 29003), and the r.f. units are $1\frac{1}{2}$ by 5 by $9\frac{1}{2}$ inches (ICA 29001). The only metal work required is the making of small aluminum guide plates for the front and rear of the converter chassis, and the mounting bracket for the interconnecting socket at the rear of the base unit. Ventilation holes are cut in the sides of the base unit, and two $1\frac{1}{4}$-inch holes are cut in the top surface of this chassis to provide greater clearance around the major coils of the r.f. assemblies, when they are in the operating position. The placing of the power supply and i.f. amplifier components on the base unit is not critical, though the arrangement shown in the photographs works out nicely from a mechanical standpoint. Chief consideration here is to avoid mounting parts on the outside walls of the units, thereby preserving to the fullest degree the deep-but-narrow form factor. This shape takes up a minimum of high-priority space on the operating table.

Care should be used in mounting the socket and plug on the base unit and converters, respectively, in order that they may line up exactly. When the job is properly done it is merely necessary to place the converter unit on the base, with the front edge tilted upward slightly, slide the plug into the socket, and then drop the converter in place. The converter assemblies should be kept free of parts in the portion that is over the rectifier tube socket, in order that no components be damaged in the plugging-in operation.

Looking at the converters for 28 and 50 Mc. from the front we see the tuning condenser for the r.f. input circuit, followed by the 6AK5 and 6J6 r.f. stages and the 6J6 mixer-oscillator, in that order. The 6AK5 plate coil, the neutralizing coil, and the mixer plate coil are slug-tuned, resonating with the circuit capacitances only.

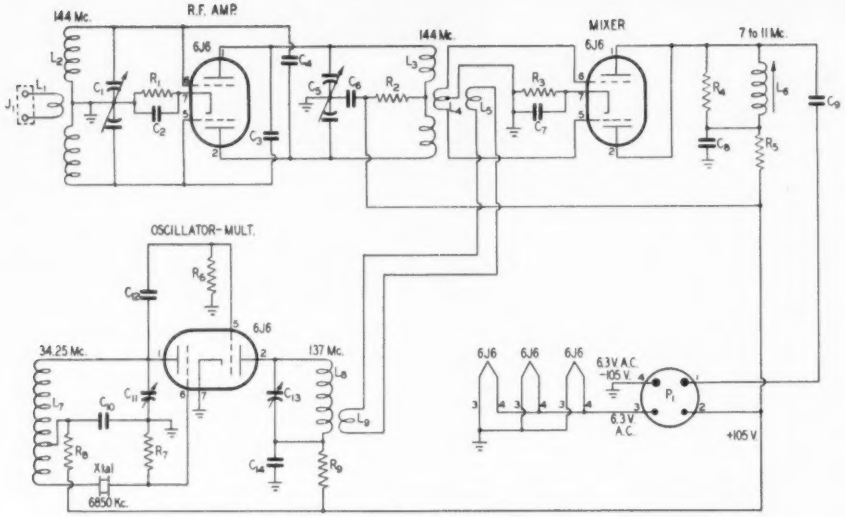


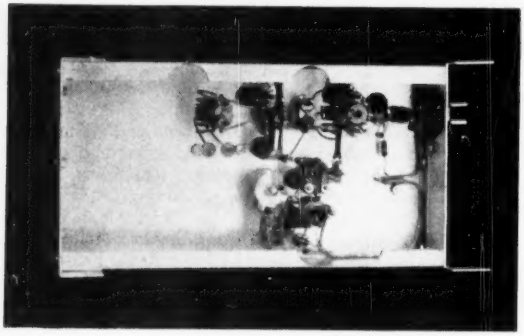
Fig. 2 — Wiring diagram of the 144-Mc. crystal-controlled converter.

C_1, C_5 — 5.3-$\mu\mu$fd.-per-section butterfly (Johnson 5MB11).
C_2, C_6, C_7, C_8, C_{10}, C_{14} — 0.005-μfd. disc ceramic.
C_3, C_4 — 75-ohm Twin-Lead neut. capacitors (see text).
C_9 — 50-$\mu\mu$fd. ceramic.
C_{11} — 50-$\mu\mu$fd. air trimmer (Millen 26050).
C_{12} — 100-$\mu\mu$fd. ceramic.
C_{13} — 5–20-$\mu\mu$fd. ceramic trimmer.
R_1, R_2 — 150 ohms, ½ watt.
R_3, R_5, R_7, R_9 — 1000 ohms, ½ watt.
R_4 — 2200 ohms, ½ watt.
R_6 — 0.22 megohm, ½ watt.
R_8 — 3300 ohms, 1 watt.
L_1 — 4 turns, No. 18 enam., 5/16-inch diam., ¼ inch long.
L_2, L_3 — 6 turns No. 18 enam., 3 turns each side of center tap, with ⅜-inch spacing between sections, ⅜-inch diam. Adjust turn spacing as needed.
L_4 — 5 turns No. 18 enam., ⅜-inch diam., close-wound and center-tapped.
L_5, L_9 — 1 turn hook-up wire wound around L_4 and L_8; 75-ohm Twin-Lead used to connect between the two coils.
L_6 — Slug-tuned plate coil (CTC LS3 5-Mc. coil with 20 turns removed).
L_7 — 11 turns No. 20 tinned, ½-inch diam., 11/16 inch long, tapped 4 turns from crystal end of coil (B & W 3003).
L_8 — 3 turns No. 18 tinned, ½-inch diam., ⅜ inch long (B & W 3002).
J_1 — Crystal socket for antenna terminal.
P_1 — 4-prong male socket.

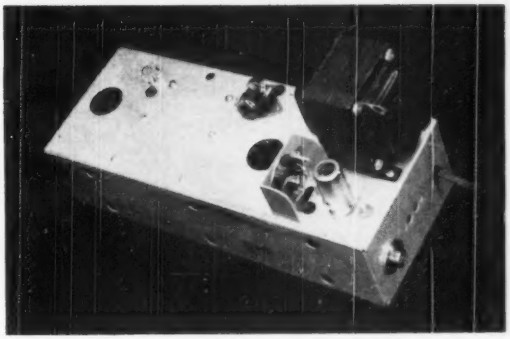
Condenser-tuned circuits are used in the r.f. input, second r.f. plate, and mixer grid circuits. The difference in position of the r.f. tuning condenser, C_1, in the two converters is the result of an improved parts arrangement used in the 28-Mc. job. Mounting of this condenser on the front wall of the converter chassis is recommended for both units.

Note the alternative input circuit for the 50-Mc. converter, shown in Fig. 1. This includes a 100-Mc. trap for elimination of f.m. interference. If the converter is to be used in a location near to f.m. broadcast stations this trap is necessary to prevent the second harmonic of the injection frequency from beating with the f.m. signals and producing spurious responses in the 50-Mc. band.

In the 2-meter converter the r.f. and mixer tubes are in line at the right side of the chassis, as viewed from the front, with the oscillator-



Bottom view of the 144-Mc. converter. Across the top of the photo, *left to right*, are the input circuit, the push-pull r.f. stage, the push-push mixer, and its slug-tuned plate circuit. Oscillator and multiplier components are at the bottom of the picture.



Base unit, with converter removed, showing the plug-in fitting for the mixer output and power connections. The 6BA6 i.f. amplifier stage is at the lower right.

multiplier at the left. This layout makes for symmetrical arrangement of the push-pull circuits. All the r.f. coils are self-supporting, so that their length and coupling can be adjusted readily. Link coupling of the injection voltage is accomplished with single-turn coils around the multiplier-plate and mixer-grid windings, connected by a short length of 75-ohm Twin-Lead.

Adjustment and Operation

Putting these converters into service once the mechanical work has been completed is a much simpler process than that involved in aligning a receiver of the gang-tuned variety. Work on the r.f. sections is made easier if a patch cord is made up so that the r.f. units can be removed from the base and kept in operating condition. The only portion of the procedure that may be troublesome is that involved in getting the crystal oscillator to work properly, and on the right overtone. The important factor here is the amount of regeneration, controlled by the position of the tap on the oscillator coil, L_7. The process is the same for all three converters, but the tap position may be somewhat more critical in the 50- and 144-Mc. units, as a higher-order overtone is used.

The proper position for the tap is that at which oscillation takes place only at the third or fifth overtone, as the converter requires. If the tap is too high on the coil oscillation will be on random frequencies, determined by the setting of C_{11}, rather than controlled by the crystal. If the tap is too low on the coil no oscillation at all will develop. The L/C ratio in the tuned circuit is also fairly critical, for best operation, but if the values given in the parts lists are followed no trouble should be encountered on this score.

To check operation of the oscillator insert a meter in series with R_8, apply plate voltage, and rotate C_{11} until a sharp dip in plate current occurs, indicating oscillation. There may be a tendency to self-oscillation at the minimum-capacity end of the tuning range, but this may be disregarded if it disappears quickly as the condenser is turned toward maximum capacity. Crystal oscillation should occur somewhere between half and maximum capacity. It is helpful if a receiver is available for listening on the fre-

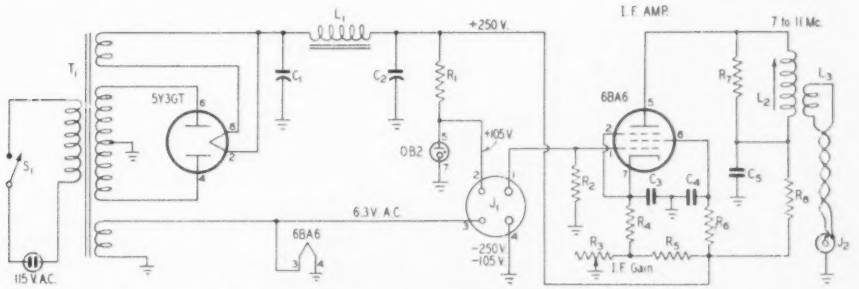
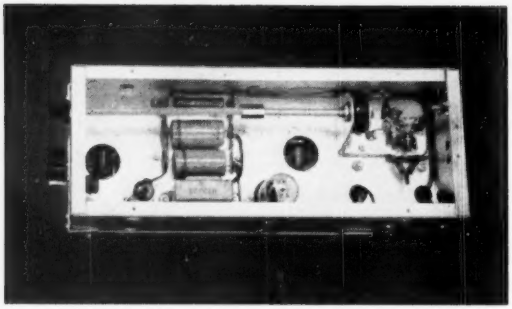


Fig. 3 — Wiring diagram of the power supply and i.f. amplifier unit for use with the crystal-controlled converters.

C_1, C_2 — 10-μfd. 450-volt electrolytic.
C_3, C_4, C_5 — 0.005-μfd. disc ceramic.
R_1 — 2500 ohms, 10 watts.
R_2 — 1 megohm, ½ watt.
R_3 — 10,000-ohm wire-wound potentiometer.
R_4 — 68 ohms, ½ watt.
R_5 — 56,000 ohms, 2 watts.
R_6 — 39,000 ohms, 1 watt.
R_7 — 2200 ohms, ½ watt.
R_8 — 1000 ohms, ½ watt.
L_1 — 10-hy. 50-ma. filter choke.
L_2 — Slug-tuned plate coil (CTC LS3 5 Mc. with 10 turns removed).
L_3 — 15 turns No. 32 enam., scramble-wound at bottom end of L_2.
J_1 — 4-prong female plug.
J_2 — Coaxial-cable jack.
S_1 — S.p.s.t. toggle switch.
T_1 — Power transformer, 275 v. each side c.t. at 50 ma.; 6.3 v. at 2.5 amp.; 5 v. at 2 amp. (Thordarson T-22R30).



Under-chassis view of the base unit, showing the power supply and i.f. amplifier components. The circular cutouts provide additional clearance around the tuned circuits in the plug-in unit.

quency of oscillation (indicated over L_7 in the diagrams) to see whether or not the crystal is controlling the frequency. If the frequency changes markedly or if pronounced hand-capacity effects are present, move the tap toward the low end of L_7 by one turn and try again. A fraction of a turn change may be necessary in some instances, to achieve crystal control without random oscillation. It is also possible that the wrong overtone may develop. With incorrect values of inductance and capacity this type of circuit may produce oscillation on any odd overtone, so a wavemeter or receiver check should be made to be certain that the proper injection frequency is being used.

Next a rough alignment of the r.f. and i.f. circuits should be made. This can be done on noise, with the receiver set at the approximate midpoint of the frequency range to be tuned, or if one has a signal generator the process is made easier. This need be nothing more than the crystal oscillator in the transmitter, using the proper harmonic, of course.

Adjustment of the neutralizing coil is the next step in the converters for 28 and 50 Mc. This is not a critical procedure, and only a slight change in noise figure (probably not noticeable in ordinary operation) will result unless the value of L_3 is very far off. A simple way to do the job is to cut off one heater pin from a 6AK5 to be used as a neutralizing tube. Disconnecting the 6.3-volt lead from the 6AK5 socket will serve the same purpose. Tune in a strong signal with the converter working normally, then put in the dummy tube (or cut off the heater) and adjust the core in L_3 for *minimum* signal, changing no other adjustments at the time. Optimum setting of L_3 can be made only with a noise generator, adjusting for lowest noise figure,[3] but the procedure outlined above provides a satisfactory approximation.

Neutralization of the r.f. amplifier in the 2-meter converter is done in the same way, except that the length of the Twin-Lead neutralizing capacitors, C_3 and C_4, is trimmed for minimum signal feed-through. An approximate setting can be made by starting with a length slightly more than 1½ inches and trimming until oscillation stops.

Final adjustment of the converters is now in order. The aim here is uniform response across the band. Knowing that best results will be obtained with the first r.f. circuits tuned on the nose, we attempt to get our broad response with the mixer and i.f. adjustments. Peak all circuits in the 10- and 6-meter converters at one end of the band, then move the receiver to the other end of the band and repeak either the mixer or i.f. amplifier plate winding for maximum response. Receiver noise is satisfactory for this test. If the response is not sufficiently broad, correction can be made with the bandpass circuits in the second r.f. plate and mixer grid circuits, stagger tuning these and the i.f. coils until reasonably flat response is attained. All this is best done with a 300-ohm resistor connected across the antenna terminals, to eliminate antenna resonance effects. If the response is flat with this set-up, variation in noise over the band with the antenna on may be disregarded, since it is a function of the antenna itself. Absolutely flat response is not important, for the over-all gain of the system can be adjusted by means of the i.f. gain control. It should be set so that, with the antenna connected, the normal noise level just starts to read on the meter. Turning the gain beyond the point at which noise becomes a limiting factor effects no improvement in signal readability.

The flatness of response in all converters can be varied by adjusting the r.f.-mixer coupling. In the 2-meter unit the coupling between L_3 and L_4 should be increased to the point where it is unnecessary to change the setting of C_5 to cover the entire band. There will be a slight amount of repeaking of C_1 necessary in all converters, though it should not make more than about one S-unit difference from one end of the band to the other, and it will have a negligible effect on the noise figure. A resistor is connected across the mixer plate coil in the 2-meter converter to assure uniform response across the band.

It will be noted that no external oscillator injection coupling is used on the converters for 28 and 50 Mc. The common cathode of the 6J6 takes care of this, but as separate tubes are used for mixer and oscillator-multiplier in the 144-Mc. job link coupling is required. It is not critical, however, and a single turn around L_8 and L_4 is all that is needed.

At this point you may be through, and ready

(*Continued on page 86*)

[3] "Noise-Generator Technique for the V.H.F. Man," *QST*, August, 1949, p. 20.

The "Mountaineer"—A Hiker's Portable

Light-Weight Compact Transmitter-Receiver for 80 C.W.

BY ROBERT W. VREELAND,* W6YBT

THERE are a few regions in California's Sierra that have not yet been spoiled by road building, and I suppose the same holds true for many other parts of the country. Although most hikers will argue that even the smallest radio unit is too much to add to the pack, few hams who contemplate a vacation trek are willing to leave all gear at home. By taking advantage of some of the newer midget components and applying careful design, both size and weight can be substantially reduced. The rig shown in the photographs measures 3 by 8 by 9 inches and weighs 9 pounds complete with batteries and antenna. It includes a 2-watt transmitter and a tunable crystal-controlled superhet receiver.

To simplify the circuit and to bring the size and weight down, it was deemed advisable to confine transmitter and receiver to c.w. operation in a single band. Although 40 meters has a better range in daylight, 80 meters seems to be the best all-around band for work in rugged country. Using the latter band, we have worked up to 250 miles at night and 20 miles during daylight hours with a quarter-wave antenna and two watts input.

The Circuit

The circuit is shown in Fig. 1. In the transmitter, a triode-connected 1U4 Pierce crystal oscillator drives a 3A4 final amplifier. Parallel plate feed is used in the amplifier and the antenna is coupled directly to the output tank circuit, C_6L_1. Coupling is adjusted by means of the tap switch, S_4.

R_1 and R_2 are voltage-multiplier resistors used in conjunction with the 1-ma meter, MA_1, to check transmitter filament and plate voltages respectively. When S_1 is in the downward position, the meter reads filament voltage with S_2 in the downward position, and plate voltage with S_2 in the upward position. R_6 is a 30-times current-multiplier shunt and the meter reads amplifier plate current when S_1 is in the upward position. When desired, amplifier grid current can be read by connecting a 1-ma. meter across the pin jacks J_2 and J_3. R_3 and R_4 are the oscillator and amplifier grid leaks, while R_5 is the screen resistor for the amplifier. C_3 is a feed-back condenser. Both oscillator and amplifier are keyed in the common negative high-voltage lead.

The neon bulb, NE_1, is in a side-tone oscillator circuit consisting of C_{23}, C_{24}, R_{21} and R_{22}. It is keyed with the transmitter and not only provides a means for monitoring keying but also serves as a warning indicator when the batteries are getting low by the change in pitch.

The output tank circuit of the transmitter serves also as the input circuit of the 1R5 converter in the receiver section. This not only is a matter of space economy but it also obviates antenna change-over. In the receiver tuning system, the 80-meter c.w. band is divided up into four overlapping segments of approximately 120 kc. each. The h.f. oscillator section of the converter is crystal-controlled at four selectable fixed frequencies and the tuning is done in the i.f. stage which covers a range of approximately 400 to 520 kc. C_{13} is the tuning control. The small frequency range provides a reasonable rate of tuning without the need for an elaborate dial. This is a point usually neglected in compact receiver design.

The crystal switches of receiver and transmitter sections are ganged so that by proper sequencing of the crystals, the receiver is always switched to the frequency range in which the transmitter crystal lies. Thus, the input circuit of the receiver is tuned automatically to the proper frequency in the process of tuning the transmitter. For the i.f. range mentioned above, the receiver-crystal frequencies should be 4010, 4110, 4210 and 4310 kc. Then, by dividing the dial scale off into 12 segments, it can be made to read in terms of kilocycles within the 100-kc. frequency band in use. As the tuning condenser increases from minimum to maximum, the dial should be marked 0 at the end of the first seg-

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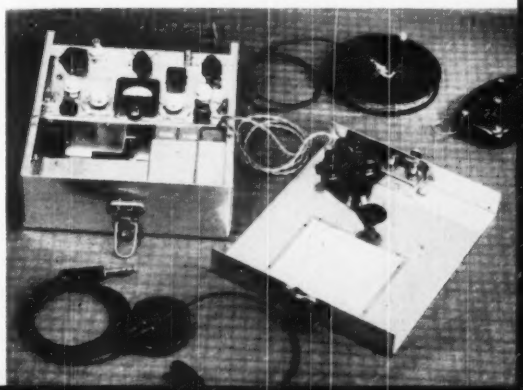


The "Mountaineer" portable measures 3 by 8 by 9 inches and weighs only 9 lbs. complete with antenna and batteries. The antenna and counterpoise (or ground) terminals are at the top. Below, from left to right, are the antenna loading control, the control switch, S_5, the external sockets for special crystals, and the crystal switch. The white knobs, from left to right, are for receiver gain, transmitter tuning, receiver tuning, and regeneration. The toggles on either side are for meter switching. Along the bottom are the fuse holder, meter dial lamp and 'phone jack. The lower portion of the case contains the batteries.

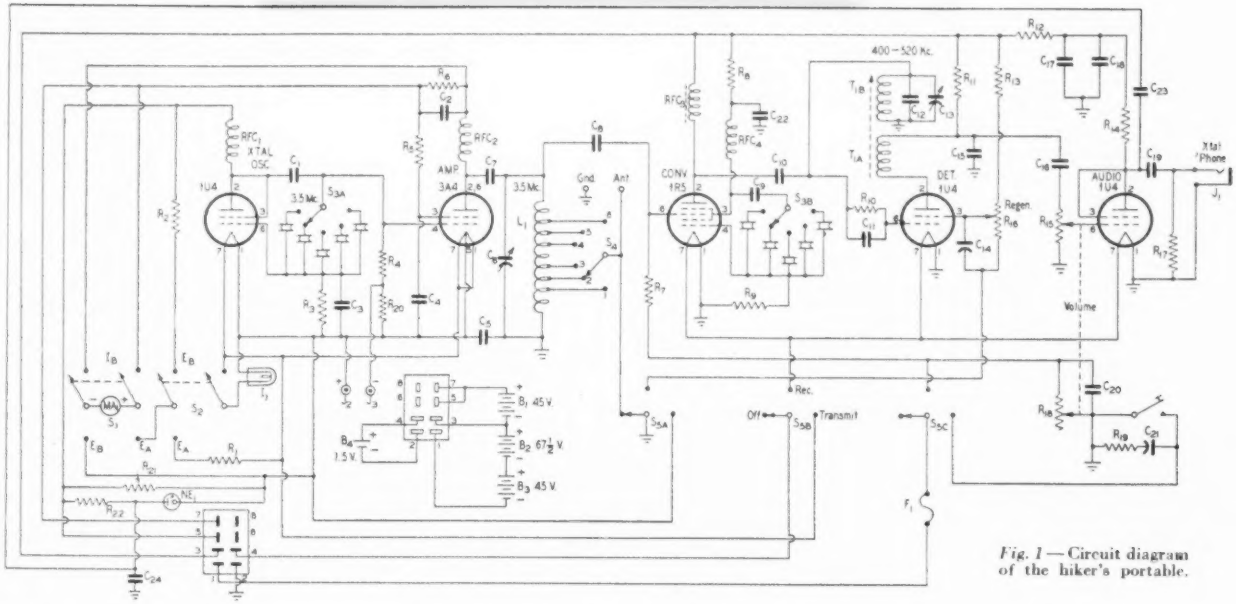


Fig. 1 — Circuit diagram of the hiker's portable.

C_1, C_2, C_7, C_9, C_{10}, C_{11}, C_{15} — 500-$\mu\mu$fd. ceramic (Centralab Hi-Kap).
C_3 — 25-$\mu\mu$fd. ceramic (Centralab Hi-Kap).
C_4, C_5, C_{16}, C_{19}, C_{20}, C_{22} — 0.0005-μfd. disc ceramic.
C_6 — 100-$\mu\mu$fd. variable (Hammarlund APC 100-B).
C_8, C_{12}, C_{23} — 50-$\mu\mu$fd. ceramic (Centralab Hi-Kap).
C_{13} — 50-$\mu\mu$fd. variable (Hammarlund APC 50-B).
C_{14} — 8-μfd. 150-volt electrolytic.
C_{17}, C_{18} — 0.01-μfd. disc ceramic.
C_{21} — 0.5-μfd. paper.
C_{24} — 0.001-μfd. ceramic.
R_1 — 2000 ohms, 1 per cent (IRC DCF).
R_2 — 0.2 megohm, 1 per cent (IRC DCF).
R_3, R_{11}, R_{14} — 0.24 megohm, ½ watt.
R_4, R_9 — 0.1 megohm, ½ watt.
R_5, R_{20} — 2200 ohms, ½ watt.
R_6 — 30-times meter shunt (adjust experimentally).
R_7, R_{10}, R_{22} — 2.2 megohms, ½ watt.
R_8 — 15,000 ohms, ½ watt.
R_{12}, R_{13} — 33,000 ohms, ½ watt.
R_{15} — 2 megohms (RC M13-139).
R_{16} — 50,000 ohms (Centralab N-114).
R_{17}, R_{21} — 0.47 megohm, ½ watt.
R_{18} — 5000 ohms (IRC PQ 11-114).
R_{19} — 39 ohms, ½ watt.
L_1 — 49 turns No. 26 d.c.c., ¾-inch diam., close-wound, tapped at 6, 8, 11, 15, 21 and 30 turns (for quarter-wave antennas only, tap at 4 and 5 turns and omit taps at 21 and 30 turns).
B_1, B_3 — 45-volt B battery (Burgess Type XX30).
B_2 — 67.5-volt B battery (Burgess Type XX45).
B_4 — 1.5-volt battery (Burgess Type 2F).
F_1 — 1/16 amp., 250 v.
I_1 — Dial lamp, 2 volts, 60 ma.
J_1 — Open-circuit jack.
J_2, J_3 — Insulated pin jack.
MA_1 — Milliammeter, 1-ma. scale.
RFC_1, RFC_4 — 750-μh. 33-ma. r.f. choke (National R-33).
RFC_2 — 1-mh. 50-ma. r.f. choke (National R-50).
RFC_3 — 25-mh. 100-ma. r.f. choke (Miller 957).
S_1, S_2 — D.p.d.t. toggle.
S_3 — 2-circuit 5-position ceramic wafer switch (Centralab 1405).
S_4 — Single-circuit 6-position ceramic wafer switch (Centralab 2501).
S_5 — 3-circuit 3-position wafer switch (Centralab-2507).
T_1 — 455-kc. i.f. transformer (Miller 12-C1 with condensers removed).

ment and 100 at the beginning of the last segment. The extreme ends of the scale, below 0 and above 100, represent overlap on the adjacent bands covered with other crystals. In the fifth crystal-switch position, connection is made to a pair of crystal sockets on the panel so that any special pair of crystals may be plugged if it should become desirable.

The 1U4 i.f.-detector is regenerative and is operated in the oscillating condition for c.w. reception. Regeneration is controlled through adjustment of screen voltage by means of R_{16}. C_{14} is made large to reduce scratch noise when adjusting regeneration. A 1U4 is used also in the audio amplifier. R_{15} is the audio gain control. It is ganged to R_{18} which simultaneously varies the bias on the signal grid of the converter tube. Biasing voltage is developed across R_{18} by virtue of the fact that it is in series with the negative high-voltage return to filament.

The first section, S_{5A}, grounds the antenna in the "Off" position, completes the i.f. detector screen voltage divider circuit in the "Receive" position, and turns on one side of the transmitter filaments in the "Transmit" position. In the "Transmit" position, it is necessary to open the i.f. screen-divider connection to ground, since otherwise 45 volts would be applied to the transmitter-tube plates through R_{16} and R_{13} even with the key open.

The second switch section, S_{5B}, turns the receiver filaments on in the "Receive" position and the second side of the transmitter filaments on in the "Transmit" position. The third section, S_{5C}, connects negative B to the receiver through the converter gain control, R_{18}, in the "Receive" position, and to the key in the "Transmit" position.

A single crystal headphone is used. Since the key is in the common plate-supply return, a keyed battery voltage gets to the headphones through the positive B lead even when the receiver is turned off. The resistance-capacitance filter in the output circuit is for the purpose of reducing clicks.

The entire unit operates from a 1.5-volt A battery and 157.5 volts of miniature B battery. The receiver operates from a 112.5-volt tap. The drain is about 25 ma. for the transmitter and only 3 to 6 ma. for the receiver.

Construction

The unit is built into a box bent up from sheet aluminum. It measures 2⅛ inches deep, 4¾ inches high and 7⅞ inches long and is open at the back and bottom. The tubes and most of the other components are mounted on an inverted "L"-shaped shelf. This shelf is 2$\frac{3}{16}$ inches high with the other two dimensions to make a snug fit in the case. Angles are bent inward at each end of the shelf so that it may be fastened in place with screws through the ends of the box. Many of the connections between the parts mounted on the panel and those on top of and underneath the shelf can be made before sliding the shelf into place, while others can be made through the bottom opening. When the wiring is complete, the bottom is closed with an aluminum cover and a felt dust gasket. Holes are cut in this cover for the key cord and the power connector. An "L"-shaped bracket fastened to the bottom holds the headphone when it is not in use.

The outer case, which holds both radio unit and the batteries, is made by cutting a 3 × 8-inch aluminum chassis to a length of 9 inches with the open end at the top. A removable cover, also made of aluminum sheet, holds the key and the key-click-filter components. When the unit is not in use, the cover is held in place with a pair of luggage clasps. A war-surplus thermos carrier makes a handy carrying case.

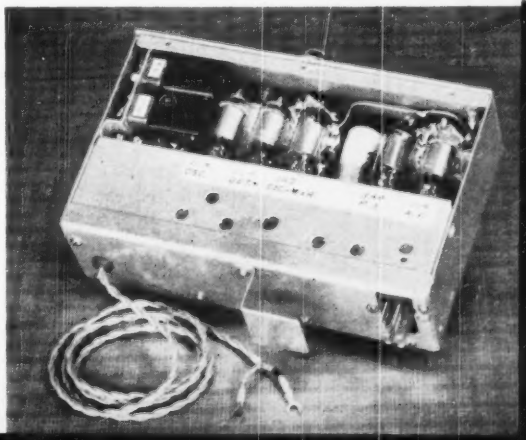
The unit is usually operated with a quarter-wave antenna and a ground counterpoise consisting of eight 35-foot radials. For portability, the counterpoise wires are wound on a 200-ft. 16-mm. movie reel. The 65-foot antenna can be kept wound up in a plastic chalk-line reel (Montgomery Ward). Insulated indoor antenna wire (Belden No. 8014) is used for both antenna and counterpoise.

Adjustment and Operation

A 39-ohm 2-watt *carbon* resistor may be used as a dummy load. The transmitter should be loaded for a final-amplifier plate current of about 16 ma. at about 3750 kc. Battery voltages should be checked. The total B-battery drain should be about 25 ma. Grid current to the 3A4 should run about 0.2 ma.

The keying should be checked by listening on a receiver. When the 1U4 oscillator tube is pulled

(Continued on page 86)



Rear view of the r.f. unit. The transmitter crystals are in the upper left-hand corner. The receiver crystals are immediately below, underneath the shelf. The tubes, from left to right, are the 1U4 oscillator, the 1U4 detector, the 1R5, 3A4 and the 1U4 audio. Hidden by the tubes, above the shelf, from left to right, are the crystal switch, the i.f. transformer, the control switch, the tank coil and the antenna-loading switch. Other components are underneath the shelf. The power plug is at the right and the key cable to the left. The bracket is for storing the headphone.

Another Inductive Coupling System for Rotary Beams

A Coupling Method That Is Independent of the Matching System

BY ROBERT E. MUMMA,* W8ORI

In the usual inductive coupling system for facilitating the rotation of beam antennas the output loop is part of the driven element.[1] There are many times when it is not convenient to make the output loop a part of the antenna system — for instance, when the "plumber's delight" type of beam is used. The coupling loop design to be described has been adapted so that the loops can be inserted anywhere in a transmission line carrying r.f. power. It consists of a single-turn input or primary loop and a single-turn output or secondary loop, shown as L_p and L_s in Fig. 1. Each loop is tuned with a variable condenser. The transmission line from the transmitter is connected across the tuning condenser C_p for the primary loop, and the transmission line to the antenna is connected across the tuning condenser C_s for the secondary loop. In both cases a balanced type of transmission line is shown.

The design of this antenna coupling system is easily followed by means of an example. Suppose that the system is to be designed for your latest 20-meter three-element beam, which is tuned to 14.2 megacycles and is being fed with 300-ohm Twin-Lead. Experience has shown that a Q between 5 and 10 for the coupling loops will bring the dimensions within reason and make the tuning broad enough to cover the entire band. Since we must start with some number, let us assume that the Q is 5.

The equivalent circuit for each of the loops in Fig. 1 is shown in Fig. 2. L is the inductance of the loop, C is the capacitance of the tuning condenser, and R is the impedance of the transmission line, which is assumed to be a pure resistance.

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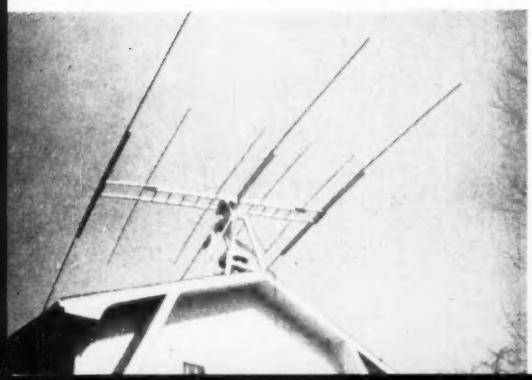
[1] Taich, "Do It Inductively," Sept., 1947, *QST*; "Inductive Coupling to Rotary Beams," Technical Topics, March, 1948, *QST*.

[2] From "Radio Engineer's Handbook" by F. E. Terman, 1943. Courtesy of McGraw-Hill Book Co.



The dual beam for 20 and 10 meters. A "T" match is used on the 20-meter driven element, while the 10-meter antenna is fed through a delta match. Both antennas are inductively coupled to 300-ohm transmission lines.

Since $Q = \frac{R}{X}$, then

$$X = \frac{R}{Q}. \qquad (1)$$

When R is 300 ohms and Q is 5, X will be 60 ohms. The losses in the loop and in the condenser are assumed to be negligible in comparison with the

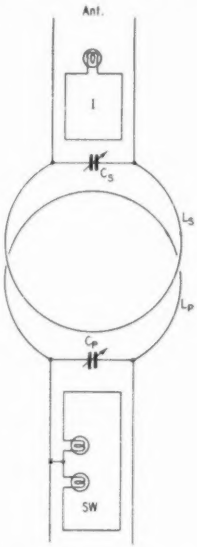


Fig. 1 — The inductive coupling system, showing the current indicator (*I*) and standing-wave indicator (*SWI*) used in the tuning-up process.

300 ohms shunting the tuned circuit. With these loops tuned to resonance X_L and X_C will both be 60 ohms. Then

$$L = \frac{X}{2\pi f} = \frac{60}{2 \times 3.14 \times 14.2} = 0.673\ \mu\text{h}. \qquad (2)$$

and

$$C = \frac{1}{2\pi f X_c} = \frac{10^6}{2 \times 3.14 \times 14.2 \times 60} = 187\ \mu\mu\text{fd}. \qquad (3)$$

Knowing the diameter of tubing available to make the loops, and the inductance desired, the diameter of the loops can be determined from the nomogram [2] shown in Fig. 3. If $\frac{1}{4}$-inch diameter

copper tubing is used, the diameter of the loop will be found to be 11 inches.

In this case, 250-$\mu\mu$fd. variable condensers can be used to tune the loops. The voltage rating required will be determined by the impedance of the transmission line and the input power. With 500 watts of unmodulated r.f. power in a matched

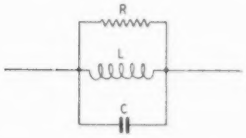


Fig. 2 — Equivalent circuit of a coupling loop.

300-ohm transmission line, the peak voltage across the condensers will be approximately 550 volts. The voltage across the condensers will rise to twice this value with 100 per cent modulation. Since the peak voltage may rise to several times this value during the tuning-up process, when standing waves appear on the transmission line, it will be well to make the initial tuning adjustments at reduced power.

The spacing between the loops for the maximum transfer of power can also be calculated, and the loops mounted permanently on stand-off insulators before the tuning operation. Letting k represent the coefficient of coupling for the maximum transfer of energy, it can be shown that

$$k = \frac{1}{\sqrt{Q_s Q_p}} \qquad (4)$$

Q_s and Q_p are the Q's for the secondary and primary loops, respectively. Since the same type transmission line is connected to both the primary and secondary loops and the loops themselves are the same, $Q_s = Q_p$. Therefore

$$k = \frac{1}{\sqrt{Q^2}} = \frac{1}{Q} = 1/5 = 0.2.$$

For the general case when any two inductances are coupled, let k represent the coefficient of coupling. Now

$$M = k\sqrt{L_p L_s} \qquad (5)$$

where M is the mutual inductance between the two loops, L_p is the inductance of the primary loop, and L_s is the inductance of the secondary loop. Since the inductances of these two loops are equal, this equation reduces to

$$M = k\sqrt{L^2} = kL = 0.2 \times 0.673 = 0.135\ \mu\text{h}.$$

The spacing between the loops can be determined, in terms of the mutual inductance, from the following formula: [2]

$$M = 1.27ND \qquad (6)$$

where M is the mutual inductance in microhenrys, D is the diameter of the loops in inches, and N is a factor depending on the diameter of the loops and the spacing between the loops. Solving for N,

$$N = \frac{M}{1.27D} = \frac{0.135}{1.27 \times 11} = 0.00966.$$

From Fig. 4 it will be noted that the value 0.00966 for N corresponds, with sufficient accuracy for these calculations, to a ratio of 0.28 for r_2/r_1. The diagram in Fig. 4 is a vertical section through the two coupling loops, with r_2 being the vertical distance or spacing between the loops and r_1 the diagonal distance from one side of the lower loop to the opposite side of the upper loop. If Y is used to represent the ratio r_2/r_1, then

$$r_2 = \frac{DY}{\sqrt{1 - Y^2}} \qquad (7)$$

Using the value 0.28 that has just been determined for Y, and 11 inches for the diameter of the loops, D, the spacing between the loops, r_2, can be found:

$$r_2 = \frac{11 \times 0.28}{\sqrt{1 - (0.28)^2}} = 3.2 \text{ inches.}$$

Construction and Tuning

All of the data are now available to make an efficient set of coupling loops for 20 meters, when using a 300-ohm transmission line. The copper tubing should be formed into as perfect a circle as possible, with the ends approximately one inch apart. The variable condensers should be connected to the open ends of each of the loops with as short leads as possible, because these leads are part of the inductance. The condensers should be mounted in weatherproof containers

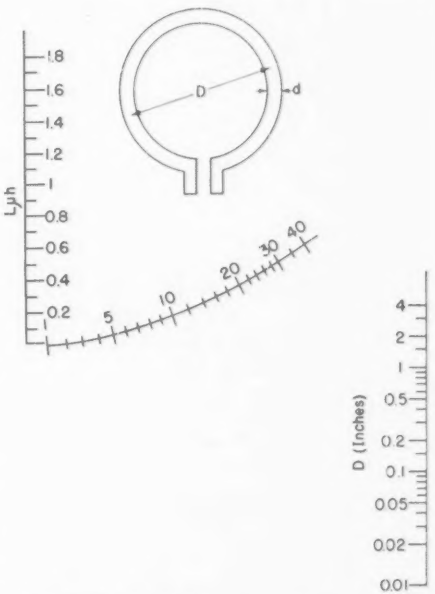


Fig. 3 — Nomogram for calculating dimensions of a single-turn loop. To use, lay a straightedge through the desired inductance on the vertical scale at the left and the conductor diameter on the vertical scale at the right. The intersection of the straightedge with the curved scale gives the loop diameter in inches.

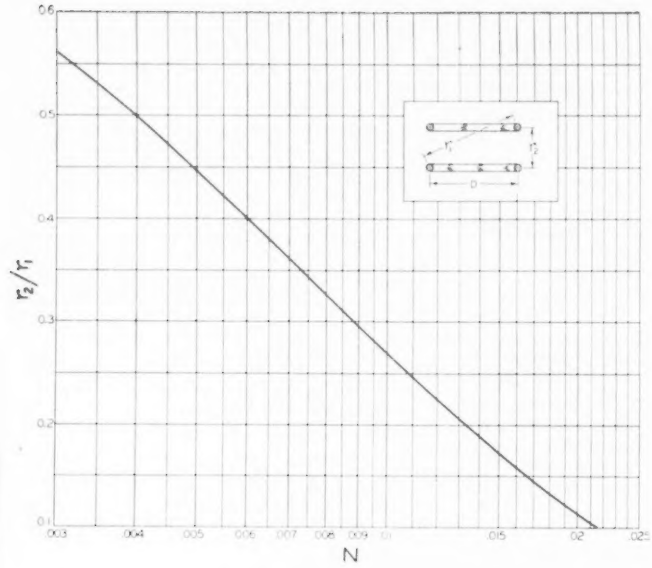
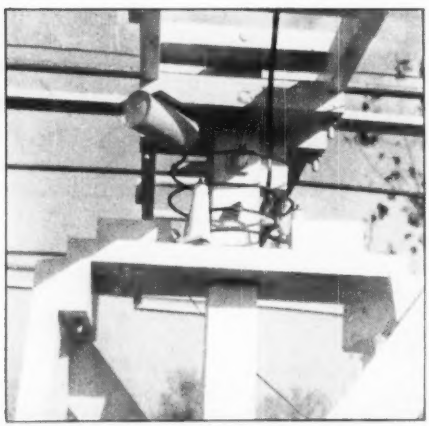


Fig. 4 — This graph is used in the determination of the spacing between the primary and secondary.

that will permit adjustment after the condensers are mounted. This can be accomplished by slotting the condenser shaft and leaving a hole large enough for a screwdriver opposite the end of the shaft. This hole can be covered with waterproof tape after each adjustment.

A simple weatherproof cover can be made by mounting the variable condenser on a screw cap that fits a glass jar large enough to accommodate the condenser.[3] The glass jar can be removed when adjusting the condenser, then replaced and sealed with a rubber ring under the lid after the adjustments are completed. This type of weatherproof covering can be mounted on the beam structure by fastening a bracket to the lid. Regardless of the type of covering used, all steel parts should be painted to prevent rust.

[3] This arrangement has been used by W8TDY.



Mounting arrangement for the coupling loops. The upper set of loops is for the 20-meter beam, the lower set for the 10-meter array. The tuning condensers are mounted in metal cans as described in the text.

The writer's installation, using metal cans to cover the condensers, is shown in one of the photographs. It will be noticed that a set of 10-meter coupling loops is mounted coaxially with the 20-meter loops. Because of the difference in frequency, these two sets of loops operate independently of each other.

Before installing the system in a transmission line, be sure that the antenna has first been matched to the line. The tuning procedure consists of tuning the secondary loop for maximum current in the transmission line to the antenna, and tuning the primary loop to eliminate standing waves on the transmission line back to the transmitter. If the spacing between the loops is correct, it will be possible to adjust the condensers so that the s.w.r. on the line to the transmitter is minimum at the same time that maximum current flows in the line to the antenna. This will not be possible if the loops are too close together or too far apart.

The current indicator for the transmission line to the antenna is shown at *I* in Fig. 1, and consists of a short length of transmission line with one end shorted and a dial lamp connected across the other end. The length of this coupling loop will depend on the current required for the lamp and the power delivered by the transmitter. The indicator can be fastened to the transmission line with short lengths of adhesive tape, and removed after the adjustments are made.

In tuning the primary loop for minimum standing waves on the transmission line, a twin-lamp indicator, shown as *SW* in Fig. 1, is probably the

easiest to use. The only precaution that should be followed is to keep the twin-lamp at least three feet away from the coupling loops. Also, if the section of transmission line on which the twin-lamp is mounted is closer than ¼ wave-length to the antenna, the line should be perpendicular to the antenna. The primary and secondary loops both may have to be tuned several times before the correct adjustment is achieved, since any great change in capacity required to tune one loop will affect the tuning of the other loop.

TABLE I

Frequency, Mc.	*14.2*	*14.2*	*14.2*	*14.2*	*14.2*	*29.0*	*52.0*
Line Zo, Ohms	300	600	600	150	52	300	300
Q	5	5	10	5	2	5	5
Loop Diam., Inches	11.0	19.0	11.0	6.5	6.0	6.5	4.0
Spacing, Inches	3.2	4.7	5.5	2.2	0.72	2.25	1.5
Capacity, μμfd.	187	94	187	374	431	92	51

It might be well to point out that if the length of the driven element is not such as to be resonant at the operating frequency, it may not be possible to match the line to the antenna properly. When this is the case it may not be possible to tune the loops correctly, because of the reflected reactance.

The transmission line may be matched to the antenna using any of the standard methods. The delta match is too well known to require description here, but the author believes that better use of the "T" match could be made if it is considered as a folded dipole. It is doubtful if an impedance transformation greater than four to one can be obtained with a "T" match using the same diameter conductor as the radiator and spaced not more than four inches from it, regardless of how long it is made. More satisfactory results can be had by using a smaller conductor for the "T," and making it roughly $\frac{1}{16}$ wave-length long. The match can then be achieved by adjusting the spacing between the "T" and the radiator. The "T" match for the radiator in my 20-meter three-element close-spaced beam is 10 feet long and uses tubing $\frac{3}{16}$ inch in diameter. The spacing is $4\frac{1}{4}$ inches (center to center) from the radiator, which is $1\frac{1}{8}$ inches in diameter.

Loops for other frequencies and other transmission-line impedances can be made by using these same equations. If a Q of 5 is used for calculating a set of loops for 10 meters the system will tune broadly enough to cover the entire 10-meter band without serious standing waves appearing on the transmission line, providing the antenna itself is flat over such a range. The higher the Q's of these loops, the more sharply they will tune, and also the farther apart they will have to be spaced to prevent overcoupling.

While the above calculations are based on the use of a balanced type of transmission line, it should not make any difference whether the center of the loop is at ground potential, as it is with a balanced transmission line, or whether one end of the loop is at ground potential, as it is with a coaxial line.

With low-impedance lines a Q of 2 or 3 should be tried, in order to keep the dimensions of the loops and the capacities of the condensers within reason. The lower Q will require closer spacing, as the calculations will show.

Also, it is possible that a certain amount of impedance matching can be done by connecting transmission lines of different characteristic impedance across the primary and secondary loops, respectively, and calculating the spacing between the loops on the basis of the resulting Q's. The

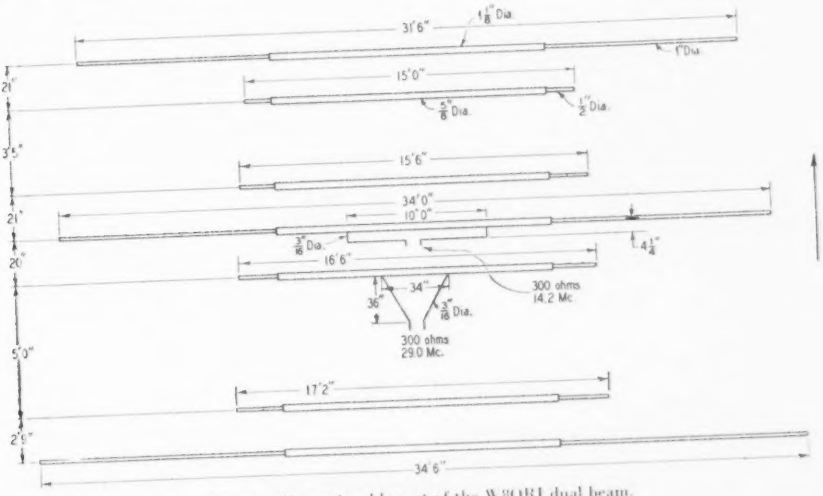


Fig. 5 — Dimensional layout of the W8ORI dual beam.

difference in Q between the primary and secondary loops will be taken into consideration when using equation (4).

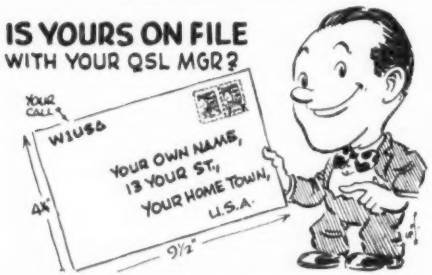
As a matter of interest, the calculated values for loops of ¼-inch tubing to be used at various frequencies with various line impedances are listed in Table I.

The W8ORI Dual Beam

For those who may want the information, a sketch of the author's dual beam is given in Fig. 5. There are three elements on 20 meters and four elements on 10, with all elements in the same plane. In both beams the reflector is 0.15 wavelength from the driven element and the director is 0.1 wavelength from the driven element (actually, the spacing for the 20-meter reflector is a little short). The parasitic-element lengths were set by formula, while the driven elements were adjusted to obtain a flat transmission line. It will be noticed that the 20-meter driven element is approximately 12 inches longer, and the 10-meter driven element 6 inches longer, than the lengths given by the usual formula. This may result from the fact that the two driven elements are located so close to each other, although the tuning of one has no appreciable effect on the tuning of the other.

The 20-meter elements consist of a 12-foot section of aluminum tubing 1⅛ inches in diameter with a 12-foot section of 1-inch aluminum tubing telescoped into each end. The 10-meter elements consist of a 12-foot section of brass tubing ⅝ inch in diameter with a 3-foot section of ½-inch brass tubing telescoped into each end.

The delta and "T" matching sections for the 10- and 20-meter beams, respectively, are made of $^3/_{16}$-inch copper tubing and extend toward the rear of the antenna. In connection with the earlier remarks about "T" matching, it may be of interest to mention that in the first attempt at matching the 20-meter beam the "T" section was about 11 feet long and was spaced 3 inches (center to center) from the driven element. The twin-lamp showed that the match was poor, regardless of adjustments to the length of the "T" section. The spacing was then changed and by experiment it was found that a center-to-center spacing of 4¼ inches gave a good match. The length of the "T" was not at all critical, but the spacing was.



SEE PAGE 32, JULY *QST*

ARRL Conventions

HUDSON DIVISION

Asbury Park, N. J., Sept. 30th–Oct. 1st

The huge Convention Hall and the beautiful Berkeley Carteret Hotel on the boardwalk at Asbury Park, New Jersey, will be the setting for the 1950 Hudson Division Convention. The dates are September 30–October 1, 1950.

One of the main attractions will be a large radio show featuring exhibits and displays by manufacturers showing all the latest equipment presently available to hams. The armed services will have a display of the latest developments in radio, radar, and electronics.

Traffic men, DX hounds, v.h.f. enthusiasts, and rag-chewers alike will find ample subject matter of their particular liking among the many technical talks that will be given by outstanding personalities. Amateur teletype will be in operation keeping an up-to-the-minute log of registrants. Just consult the teletype printer in Convention Hall to see if your friends have arrived.

Saturday nite there will be dancing in the Crystal Terrace Room of the Berkeley Carteret Hotel. Sunday A.M. there will be a hidden-transmitter hunt on ten meters with an award for the outstanding ham-engineered installation. There will be meetings of the MARS, Quarter Century Wireless Association, and an invitation into the Royal Order of the Wouff Hong.

Oh yes — the XYLs and YLs will be amply provided for. So gals, don't bring your knitting. There will be a fashion show, dance recital, and plenty else to keep you occupied.

Registration is $1.50 for advanced registration and $4.00 extra for the Sunday banquet. If you wait until you arrive, registration is $2.00. Just drop your letter and remittance to W. F. Kennison, W2BTG, P.O. Box 927, Red Bank, New Jersey.

NEW HAMPSHIRE STATE

Concord, N. H., Sept. 17th

The thirteenth annual ARRL New Hampshire State Convention and Hamfest will be sponsored this year by the Concord Brasspounders (W1OC) and will be held in the Masonic Temple in Concord, N. H., on Sunday, September 17th.

Registration will be at 10:00 A.M. and the FCC will commence giving Class A and B examinations at 11:00 A.M. This will be the time to get that advanced ticket. Also scheduled is a two-meter treasure hunt, so don't forget that mobile gear. ARRL meetings, QSL card contest, gadget contest, etc., will complete the program.

Banquet at 2:30 P.M., family style, menu not yet determined. Get your tickets in advance from W1BFT, Box 312, Concord, N. H. The price will be $3.75.

SOUTHWESTERN DIVISION

Santa Barbara, Calif., Sept. 9th

The Southwestern Division ARRL Convention will be held in Santa Barbara, Calif. on Saturday, September 9th, under the auspices of the Santa Barbara Amateur Radio Club. Convention Headquarters will be the Hotel Mar Monte on East Cabrillo Boulevard on the water front.

There will be plenty of technical talks and discussions, mobile rig contests, code speed contest, hidden transmitter hunt, radio parts show, etc. Among the speakers will be ARRL President George W. Bailey, W2KH. To wind up the convention there will be one of the famous Chris Pripp's Barbecues at the Veterans' Memorial Building.

The registration fee of $4.00 covers all official convention activities, and may be sent to H. A. Lloyd, P.O. Box 929, Santa Barbara, Calif. Those wanting hotel or motel reservations should include an extra $3.00 deposit with their registration.

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The Massachusetts State Convention, scheduled for September 23rd, has been canceled because a large portion of the sponsoring Hilltop Amateur Radio Club has been called to active duty in the Marine Corps.

Happenings of the Month

CIVILIAN DEFENSE PLANNING

A stepped-up study of planning for civilian defense is now in process under direction of the National Security Resources Board, in which the President has lodged over-all responsibility for coördinating U. S. resources. A general meeting of the communications group was held July 7th, under the chairmanship of Paul Larsen, director of the civilian mobilization office, attended by the military, other government agencies, and the industry, including President Bailey and Communications Manager Handy on behalf of ARRL.

The discussion treated many phases of civilian defense and how communications can implement the program. The trend of thinking seems to be that which was embodied in the Hopley report,[1] i.e, to place primary responsibility on states and municipalities, with the Federal Government furnishing the basic plan and guidance as well as training a skeleton staff which would then be sent to the states to mobilize and build regional and local organizations. At present, exercises are being conducted in typical cities to examine the problems in connection with possible enemy attack, as a guide for further planning.

The facilities of amateur radio were again offered by the League, and the eventual plan is expected to include ample provisions for the volunteer emergency communications services which amateurs can furnish. At the moment efforts are directed to study and planning, with at least a pattern plan available in early autumn. No mobilization of workers or training exercises are immediately contemplated. Amateurs should, however, keep closely in contact with ARRL field organization officials, particularly their local Emergency Coördinator, so that we shall be ready to go when we get the green light.

Also under discussion at the meeting was the frequency band 1750–1800 kc., which FCC earlier this year began actual planning as a Disaster Communications Service band, per U. S. proposals at the 1947 Atlantic City conference. It was agreed that civilian defense communications would have a very vital need for this band, perhaps in the manner proposed at a June FCC conference (also attended by the League): for intercommunication or liaison channels between the various services (amateur, police, government, etc.) providing disaster communications.

E.A.R.C.

After some postponements, the Extraordinary Administrative Radio Conference has now been called to begin September 25th at The Hague, Netherlands. In general, it may be said its objectives are twofold: first, to study the work of the Provisional Frequency Board and, if possible, complete a new world-wide station list to accord with the Atlantic City directive for frequencies below 27.5 Mc.; second, to decide on dates and procedures by which the Atlantic City allocation table below 27.5 Mc. may be brought into effect. In the process of accomplishing these objectives the conference will undoubtedly consider the work of the various regional and special service meetings (aeronautical conferences, high-frequency broadcasting conferences, Inter-American Radio Conference, etc.) which have met since 1947, and whose work in many cases has been in line with the broad general objectives outlined above.

As can be seen, the principal work of the EARC will involve amateur radio only to the extent that the establishment of effective dates for implementing the Atlantic City table below 27.5 Mc. will determine when we begin use of the band 21,000–21,450 kc. and lose the use of 50 kc. at the high end of the 14-Mc. band. However, there is the possibility that there will be an examination of the Region II action in connection with our 3500–4000 kc. band,[2] the "legality" of which has since been challenged. The conference may also run into difficulties in setting up a new frequency list and formulating a date or dates for implementation of the table. With these considerations, the Board at its May meeting directed that the Secretary attend the conference on behalf of the League and amateur radio, and Secretary Budlong will be leaving for The Hague in mid-September. Arrangements are under way for the Netherlands amateur society to represent IARU.

As we write in late July, the Korean situation has not yet altered plans for the conference.

ANTENNA HEIGHT RULES

Some time ago the Federal Communications Commission, apparently as a result of concern expressed by aeronautical interests over rapidly-sprouting broadcast (standard, television and f.m.) antenna structures, began consideration of tightening up its rules governing construction, marking and lighting of antenna towers in the vicinity of airports; recently it published the text of proposed new Part 17 to cover the subject in exhaustive detail. While the new rules obviously were designed with broadcast and other commercial stations in mind, a study by the League indicated that their strict application to amateurs would bring about some intolerable situations — for example, in certain cases requiring the painting and lighting of a ten-foot antenna mast; on July 3rd, therefore, the League

[1] *QST*, Jan., 1949, p. 34.

[2] *QST*, September, 1949, p. 35.

filed comments on the Commission proposal, pointing out that undue restrictions would result if any attempt were made to apply the rules to amateur stations, and requesting that the text be clarified as necessary to exclude amateurs from the provisions.

F.C.C. REORGANIZATION

FCC is in the process of completing a revision of its internal operating set-up, primarily to create bureaus devoted to specific classes of radio services which will be practically self-sufficient and include legal as well as administrative and engineering talent. Amateur radio comes under the over-all jurisdiction of a new (effective August 1st) Safety & Special Radio Services Bureau headed by Col. Edwin L. White, an old-time ham and for years an aviation specialist in FCC. Under this bureau, the old Radio Operator & Amateur Division disappears, being succeeded by the State-Local Government and Amateur Division, and we are happy to say that George K. Rollins, W3GA, head of the old division since its formation by then Chief Engineer Sterling, W3DF, in 1947, has been appointed chief of the new division having responsibility for amateur matters.

W3GA

New chief of the Amateur Branch of the division is Ivan H. Loucks, W3GD, a ham since the early 20s (ex-8AC, 8ABO, 8CTS, 4GD, W9ON, W3GYW) and a long-time employee of FCC, having started as a radio inspector with the Department of Commerce in 1931. What he didn't know about amateur radio from his own hamming he certainly learned in his stints at the Grand Island monitoring station and the Philadelphia field office, as well as postwar duties as chief of the radio operator branch in the old division. Like his predecessor chief of amateur matters, W4IQR, OM Loucks is from Rochester, N. Y., and has a splendid record of Navy service: his dates from 1929 as RM3c, a commission in 1935, active duty during World War II — primarily in the Pacific theater in connection with the Okinawa campaign and later the Bikini atom bomb tests but also including an assignment as DCO of the Potomac River Naval Command — and at present the rank of Commander in charge of a Washington electronic company. W3GD operates mostly on 40 and 20 c.w., with occasional flings on 10-meter mobile 'phone.

W3GD

Robert W. Percy, W4IQR, former chief of amateur matters, now has the long title of Chief, Application Advisory Branch, Administration Analysis Division (of the new bureau) and the job of handling special engineering and legal problems in connection with the processing of applications of all types. W4IQR has done yeoman service for amateur radio in the past few years and we wish him continued success.

N.F.M. EXTENSION

FCC has extended until July 31, 1951, unless sooner amended, authorization for the use of narrow-band frequency and phase modulation in 3850–3900 kc., 14,200–14,250 kc., 28.5–29.0 Mc., and 51.0–52.5 Mc. When matters in Docket 9295 are finally settled, it is expected that suitable provision for n.f.m. will be a permanent part of new regulations.

ELECTION NOTICE

To All Full Members of the American Radio Relay League Residing in the Central, Hudson, New England, Northwestern, Roanoke, Rocky Mountain, Southwestern and West Gulf Divisions:

An election is about to be held in each of the above-mentioned divisions to choose both a director and an alternate director for the 1951–1952 term. (In the case of the alternate director, West Gulf Division, the winning candidate will take office immediately to fill the present vacancy.) These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Constitution & By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 20th. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for alternate director therefrom. No person may simultaneously be a candidate for both offices. Inasmuch as all the powers of the director are transferred to the alternate in the event of the director's death or inability to perform his duties, it is of as great importance to name a candidate for alternate as it is for director. The following form for nomination is suggested: (West Gulf nominators of *alternate* director candidates should paraphrase the example to read *"for the unexpired remainder of the 1949–1950 term and the 1951–1952 term."*)

Executive Committee
The American Radio Relay League
West Hartford 7, Conn.

We, the undersigned Full Members of the ARRL residing in the ..... Division, hereby nominate ....., of ....., as a candidate for director; and we also nominate ....., of ....., as a candidate for alternate director; from this division for the 1951–1952 term.
(Signatures and addresses)

The signers must be Full Members in good standing. The nominee must be a Full Member and must have been both a member of the League and a licensed radio amateur operator for a continuous term of at least four years immediately preceding receipt by the Secretary of his petition of nomination, except that a lapse of not to exceed ninety days in the renewal of the operator's license and a lapse of not to exceed thirty days in the renewal of membership in the League, at any expiration of either during the four-year period, will not disqualify the candidate; provided that if a candidate's membership was interrupted by reason of service in the armed forces of the United States or Canada between September 1, 1939, and May 3, 1947, he shall not be deemed to be disqualified so far as concerns continuity of membership if within those dates he resumed his League membership within the 90 days following his release from active military

duty. He must be without commercial radio connections: he may not be commercially engaged in the manufacture, selling or renting of radio apparatus normally capable of being used in radio communication or experimentation, nor commercially engaged in the publication of radio literature intended, in whole or part, for consumption by licensed radio amateurs. Further details concerning the eligibility are given in By-Law 12. His complete name and address should be stated. The same requirements obtain for alternate as for director. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1950. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of alternate. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for alternate but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1st and November 20th, except that if on September 20th only one eligible candidate has been nominated, he will be declared elected.

Present directors and alternates for these divisions are as follows: *Central Division*: director, John G. Doyle, W9GPI; alternate, Wesley E. Marriner, W9AND. *Hudson Division*: director, Joseph M. Johnston, W2SOX; alternate, Gay E. Milnis, jr., W2NJF. *New England Division*: director, Percy C. Noble, W1BVR; alternate, Clayton C. Gordon, W1HRC. *Northwestern Division*: director, R. Rex Roberts, W7CPY; alternate, Allan D. Gunston, W7GP. *Roanoke Division*: director, J. Frank Key, W4ZA; alternate, Gus M. Browning, W4BPD. *Rocky Mountain Division*: director, Franklin K. Matejka, WØDD; alternate, William R. White, WØPDA. *Southwestern Division*: director, John R. Griggs, W6KW; alternate, John E. Bickel, W6NY. *West Gulf Division*: director, David H. Calk, W5BHO; alternate, none.

Full Members are urged to take the initiative and to file nomination petitions immediately.

For the Board of Directors:

A. L. Budlong
Secretary

July 1, 1950

SPECIAL ELECTION NOTICE

To All Full Members of the American Radio Relay League Residing in the Dakota Division:

A special election is about to be held in the Dakota Division to choose an alternate director to fill the vacancy occasioned by the unfortunate death of Robert A. Kimber, WØBLK. Election procedures are generally as described above. Nominating petitions are hereby solicited; they must reach the Headquarters office by noon of September 20th. The term to be filled expires January 1, 1952.

For the Board of Directors:

A. L. Budlong
Secretary

July 1, 1950

Strays

By special arrangements with publishers in Buenos Aires, each year there is a Spanish-language edition of the ARRL *Radio Amateur's Handbook*. The 1950 Spanish edition recently appeared and we have copies available here at ARRL Headquarters. They are $4.00 per copy, postpaid.

Fall V.H.F. QSO Party

September 23rd–24th — Certificates for Leaders

The League announces an early-fall V.H.F. Party as a chance for all v.h.f. operators to try for new QSOs and DX. This is an invitation to all amateurs who can work any or all v.h.f. bands (50 Mc. or above) to use 'phone, m.c.w. or c.w. between 2 P.M. local standard time (EST, CST, MST, PST) Saturday, September 23rd, and midnight local standard time Sunday, September 24th. See what new stations and states *can* be worked. Try out your new antennas and gear. Don't miss this. Mark your calendar today and see where your signals will land in a period in which you are assured that the v.h.f. brotherhood all over the land is in there listening for you.

How To Take Part

Call "CQ contest" to get in touch with other contestants. When using c.w. or m.c.w., call "CQ." Exchanging signal-strength and readability reports is suggested but not required. When you work another v.h.f. amateur, you must give him the name of your ARRL section. Page 6 of this issue is a register of the League field-organization set-up, and serves as a convenient section check-off list. ARRL staff members are not eligible for awards. You compete only with amateurs in your own ARRL section for the certificate award.

Count 1 point for successfully-confirmed two-way exchanges of section information on 2 or 6 meters. A one-way exchange does *not* count. When two-way exchanges are accomplished with your transmitter on the 220-, 420-, 1215-Mc. or higher bands, you may record 5 *points* per QSO.

Multiplier

The sum of station points earned is multiplied by a section multiplier. Each time a new section is worked two-way it adds one to the multiplier. *The multiplier grows by one if you rework this same section on another band.* (Scoring differs in this respect from other ARRL competitions to encourage everyone to make use of *as many* v.h.f. bands as possible.) A simple tabulation with points and section list is all that is required. A card to Headquarters will bring the simple form on which to report; or your own similar tabulation will be accepted.

Rules

1) Name-of-section exchanges must be acknowledged by both operators before either may claim the point(s).

2) All claimed contacts must fall in the contest period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

3) Fixed-, portable- or mobile-station operation *under one call*, from one location only, and by one operator is permitted.

4) The band your transmitter is on determines whether a QSO counts 1 or 5 points. Cross-band work shall not count.

(*Continued on page 88*)

A Simple Voice-Operated Keyer for Automatic Break-In Operation

BY J. L. FLANAGAN,* W1SJT

CONSIDERABLE interest currently exists among radio amateurs regarding voice-operated keyers for automatic break-in 'phone operation. Automatic break-in or talk-to-talk operation of the transmitter is or will be of particular interest to operators who wish to get every watt of power possible out of their final amplifiers. Using a voice-operated carrier, the transmitter is turned on only for the length of time necessary to transmit the desired speech message. The final amplifier may then be operated in a slightly overloaded condition for these relatively short periods without seriously impairing the life of the tube. Since the carrier is turned off when no speech is being transmitted, the over-all efficiency of transmission is improved.

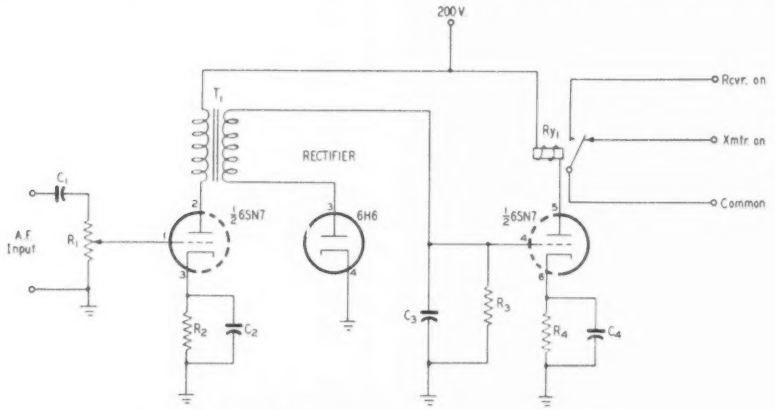


Fig. 1 — Wiring diagram of the voice-operated transmitter control.

C_1 — 0.25-μfd. paper.
C_2, C_4 — 8-μfd. electrolytic, 25 volts.
C_3 — 0.5-μfd. paper.
R_1 — 50,000-ohm volume control.
R_2 — 1000 ohms.
R_3 — 0.27 megohm.
R_4 — 2000 ohms.
All resistors ½ watt.
Ry_1 — Sensitive relay. See text.
T_1 — 1-to-3 interstage audio transformer.

There have been numerous electronic and electromechanical circuits, varying widely in complexity, devised to accomplish automatic keying. We wish to offer here an extremely simple arrangement which has been found to function very well and to compare favorably with other schemes of automatic keying.

The speech signal is fed into the circuit as shown in Fig. 1. The first stage is a conventional Class A amplifier, transformer coupled to a diode rectifier in the second stage. The speech signal is rectified by the diode and passed through an *R-C* filter causing a negative voltage, sufficient to produce cut-off, to appear at the grid of the third tube. The third stage has a sensitive relay in its plate circuit and is normally conducting with no signal input. Thus the relay is energized, the transmitter contacts held open, and the receiver contacts held shut by the plate current passing through the relay coil. When the third tube is cut off by the rectified signal, the transmitter contacts close and actuate the main keying relay of the transmitter. The receiver contacts are opened at the same time and the receiver placed on stand-by. The integrating time or time constant of the *R-C* filter in the diode stage has been selected so that the transmitter contacts remain closed while the operator is speaking at a normal conversational rate. The speech input to the circuit may be obtained from a modulator driver stage, and a signal of about 1 volt r.m.s. is required to operate the unit.

None of the elements employed in the circuit requires special comment except the sensitive plate relay. The relay used here was taken out of a surplus AN-CRW-2A remote-control aircraft receiver. It is a single-pole double-throw type with a d.c. resistance of approximately 8000 ohms, and can be energized by a current of about 2 ma. Any sensitive relay of this general nature should serve equally as well. The restraining spring on the movable contact will, in general, have to be adjusted to give the proper make and break characteristics.

* 41 Grozier Road, Cambridge, Mass.

A Two-Control VFO Rig with Bandpass Exciter

120 Watts — F.M. or C.W. — 80 to 10 — with fewer controls

BY C. VERNON CHAMBERS,* W1JEQ

PART II

(*Part I of this article appeared in the August issue of QST.*)

Having covered the circuit details and construction of the transmitter proper, we can now proceed with a discussion of adjustment. In addition, an antenna tuner will be described.

Coil and Filter Construction

Coils L_3 through L_{13} all make use of 1-inch Millen No. 45000 forms. L_9 is a conventional winding close-wound on the outside of the form. Coils L_7, L_8 and L_{10} through L_{13} are constructed so as to allow variable coupling between the sections of the filters. To do this, first coat the form with a light covering of ordinary face or baby powder. Then wind a band of either Scotch or masking tape, sticky side out, around the form. The gummed surface of the tape will hold the turns of wire in place as they are wound and the finished winding, including the tape, may be slipped off the form, coated with coil dope and put away to dry while another winding is being made.

Inductors L_3 through L_6 are commercial windings mounted *inside* the forms. The forms are prepared for the windings by cutting slots from top to bottom along two opposite sides. This operation can be performed most conveniently with a hack saw. The leads from the coils inside the forms ride in the slots so that the coupling can be varied readily. The Miniductor windings as well as the larger coils can best be cut to size with a sharp knife. The plastic strips on the Miniductors are sandpapered down to make a snug fit inside the form but one that is loose enough to permit the upper coil to slide for adjustment.

To keep the coil-to-condenser leads short in the 28-Mc. coupler, the coils are mounted in a self-supporting manner right at the terminals of the capacitors. After testing the transmitter, the spacing between the two coils is made permanent by means of a strip of polystyrene held in place with Duco cement.

The couplers may be preassembled before they are mounted in the chassis. The strips of $\frac{1}{8}$-inch insulating sheet which support two couplers are each $1\frac{3}{4}$ by 4 inches in size, while those for the single-coupler units measure $1\frac{3}{4}$ by 2 inches. Each unit requires five mounting holes — one for the No. 8 brass screw which holds the coil form in place and four for the No. 4 screws which anchor down the two trimmer condensers. Holes drilled at the corners of each unit pass the screws which fasten the units to the chassis. It is also advisable to drill a hole under the adjustment screw of each trimmer condenser.

One of the amplifier tank coils, preferably L_{16}, should have an adjustable end turn. This can be accomplished by breaking through two of the three supporting strips. The rear view of the transmitter shows L_{16} with one of the end turns pulled away from the other four turns.

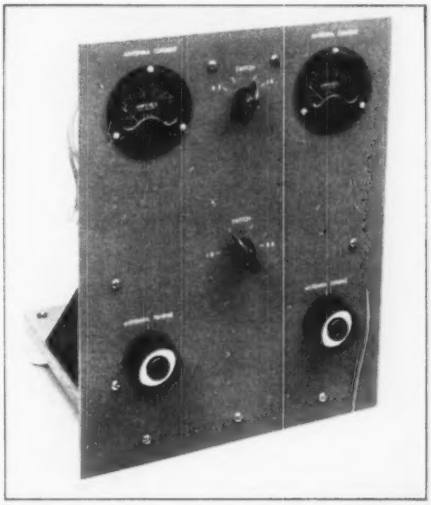
Power Supplies

The power-supply requirements are 300 volts at approximately 150 ma. and 600 volts at 200 ma. A negative bias of 45 volts for the 829-B power tube may be obtained from any convenient source. Because the frequency-control circuit of the transmitter is protected by a VR-150 regulator tube, it is not important that the low-voltage supply have exceptionally good regulation.

Adjustment and Operation

Before power is turned on for the initial test, it is advisable to disconnect one end of the 829-B screen resistor, R_{26}, so that the screen voltage will not be applied until the amplifier circuit is ready for testing.

The most useful and practical test equipment



The antenna coupler matches the transmitter in appearance and in the ability to change bands rapidly.

* Technical Assistant, *QST*.

consists of a calibrated receiver and a high-resistance voltmeter. In making grid-voltage measurements, a 2.5-mh. r.f. choke must be attached to the end of the negative probe to obtain true readings. If a vacuum-tube voltmeter is available, so much the better. The receiver is used to monitor the frequency of the oscillator signal as the tuning range is adjusted, by means of the band-set capacitor, C_{35}, to cover 1.685 to 2.0 Mc. The voltmeter, connected across the 6AG7 amplifier grid leak, R_{22}, provides means for checking the performance of the first bandpass coupler. The coupler should be adjusted to match the performance indicated by the curves shown in Fig. 2 as closely as possible.

The simplest method of tuning the couplers starts with the two coils separated as far as possible and the two trimmer capacitors adjusted to give maximum voltage across R_{22}. The operating frequency should be approximately 3.7 Mc. during these adjustments. Coupling between sections of the coupler is now increased until the grid-voltage curve begins to resemble that of Fig. 2. Slight readjustments of C_{41} and C_{44}, and further adjustment of the coupling should result in a dip in grid voltage at 3.7 Mc., voltage peaks at 3.5 and 3.9 Mc., and a rapid decrease in voltage at points outside of these last two frequencies. The attenuation at frequencies remote from the desired range can be determined by varying the oscillator frequency over a large spectrum by means of the band-set capacitor, C_{35}.

The second bandpass coupler is lined up in a similar manner. However, the adjustment this time is made with the coupler switched to the 829-B grid circuit and the amplifier grid meter is used as the indicating device. The response curve should be similar in shape to that of Fig. 2, although the reading will be registered in terms of grid current rather than voltage. Amplifier grid current should be 16 to 18 ma. at the peaks of the curve and should fall off not more than 1 or 2 ma. at the center of the band.

Voltage and Current Table for the Low-Level Tubes of the Bandpass Transmitter

Tube	*Freq., Mc.*	E_p	E_s	E_g	E_k	I_k, *Ma.*
6AG7	1.7	150	150	— 12	—	8
6AG7	3.5	300	150	— 35	6	20
6N7	7	300	—	—100	13	22
6N7	14	300	—	— 70	21	20
6N7	27	300	—	—100	14	29
6N7	28	300	—	— 65	14	30

The voltmeter should now be connected across the doubler-circuit grid leak, R_{18}, and the bandswitch set at the 7-Mc. position. C_{28} may now be adjusted until the grid voltage at the 6N7 grid follows the general pattern of the preceding circuits. With C_{28} properly adjusted, the grid voltage should average approximately 100 volts across the 3.37 to 3.7-Mc. range.

Adjustment of the 14-, 27- and 28-Mc. couplers and the associated compensating capacitors is now carried on step by step. Each coupler is switched first to the amplifier grid circuit, lined up for the bandwidth indicated on the circuit diagram, and then switched over to the following doubler stage so that the compensating capacitor may be adjusted.

Testing of the final amplifier is straightforward. However, it does take a little time to get accustomed to the tuning of the plate tank circuit. This circuit tunes to 3.5 and 14 Mc. with the condenser set at nearly full capacitance. Resonance of the tank at 7, 27 and 28 Mc. occurs with the capacitor set well toward minimum capacitance. A 100-watt lamp bulb, connected directly across the output jack, makes an excellent dummy load for preliminary adjustment of the output coupling circuits.

Aside from the checks made with any power amplifier, there is one adjustment that requires attention. It is essential that the tank does not resonate at 3.5 and 14 Mc. at the same setting of C_{54}. The same condition at 7 and 28 Mc. must be avoided. This double-resonance effect is objectionable because it results in amplification at the fourth harmonic when the amplifier is tuned to either 3.5 or 7 Mc. The adjustable turn of L_{16} will permit an alignment of the tank to prevent this.

A current and voltage table shows the approximate operating conditions for the low-level tubes. Under full load, the 829-B grid current and grid voltage should average 12 ma. and 70 volts, respectively, and the screen should draw about 30 ma. at 200 volts. The amplifier may be loaded to a plate current of 200 ma.

Coil Table for Bandpass Transmitter

Coil	$L_{\mu h.}$	*Wire*	*Turns*	*Diam., In.*	*Length, In.*	*Coil Spacing, In.*	*B & W Type No.*
L_1, L_3	1.18	20 tinned	8	1	$\frac{1}{2}$	L_1, L_2 — $\frac{1}{2}$	3011
L_2	0.99	20 tinned	7	1	$\frac{7}{16}$	——	3011
L_4	0.81	20 tinned	6	1	$\frac{3}{8}$	L_3, L_4 — $\frac{1}{16}$	3011
L_5	4.1	24 tinned	15	1	$\frac{15}{32}$	L_5, L_6 — $\frac{9}{16}$	3012
L_6	2.26	24 tinned	10	1	$\frac{5}{16}$	——	3012
L_7	15.8	30 enam.	21	1	$\frac{7}{32}$	L_7, L_8 — $\frac{7}{16}$	——
L_8	9.8	26 enam.	16	1	$\frac{9}{32}$	——	——
L_9	92.0	30 s.s.c.	68	1	$\frac{19}{32}$	——	——
L_{10}, L_{11}	52.5	30 enam.	42	1	$\frac{7}{16}$	L_{10}, L_{11} — $\frac{3}{16}$	——
L_{12}	53.5	30 enam.	44	1	$\frac{1}{2}$	L_{12}, L_{13} — $\frac{1}{4}$	——
L_{13}	42.0	30 enam.	37	1	$\frac{13}{32}$	——	——
L_{14}	0.1	14 enam.	3	$\frac{3}{8}$	$\frac{1}{2}$	——	——
L_{15}	1.05	14 enam.	3	$2\frac{1}{2}$	$\frac{3}{8}$	——	3906
L_{16}	2.0	12 enam.	5	$2\frac{1}{2}$	1*	——	3905
L_{17}	6.5	14 enam.	10	$2\frac{1}{2}$	$1\frac{1}{4}$	——	3906
L_{18}	5.4	14 enam.	9	$2\frac{1}{2}$	$1\frac{1}{8}$	——	3906

* End turn adjustable — see text.

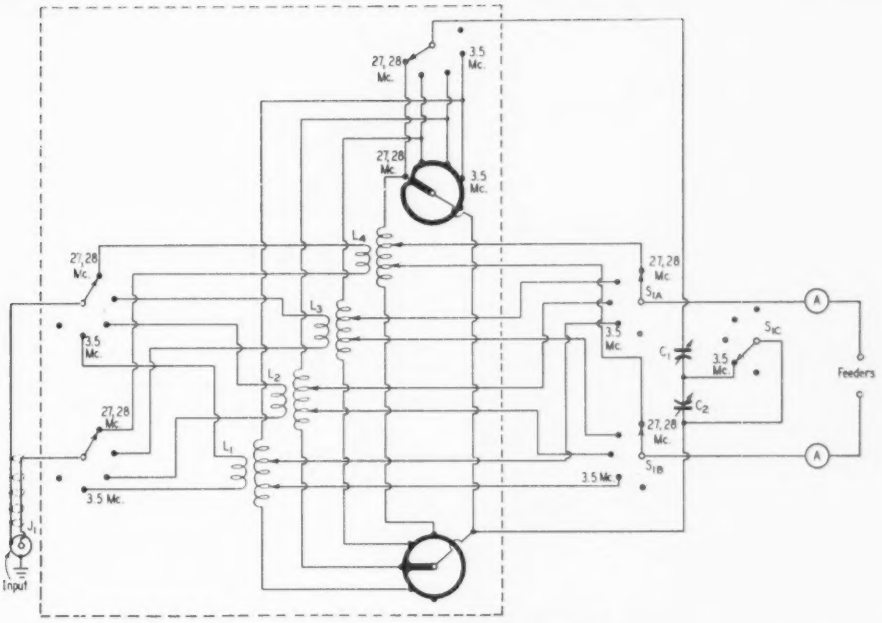


Fig. 3 — Circuit diagram of the antenna coupler.

C_1, C_2 — 300-$\mu\mu$fd. variable condenser (National TMS-300).

L_1, L_2, L_3, L_4 — Input-coupling links wound inside of antenna coils. Adjust number of turns for adequate loading of transmitter.

A — 0–3 thermocouple r.f. ammeter (actual range required will depend on the antenna system used).

J_1 — Coaxial-cable jack.

S_{1A}, S_{1B}, S_{1C} — 3-pole 3-section 5-position selector switch (Centralab 2521).

NOTE: All components inside dotted line, except L_1, L_2, L_3 and L_4, are parts of B & W 150-watt turret.

Testing the Audio Section

The power amplifier should be turned off (do not forget to remove screen voltage) while the audio system is undergoing the first test. After a microphone has been connected to J_1 and the low-voltage supply turned on, the output signal of the transmitter should be monitored by means of a receiver. Modulation should be applied for this test and, with the receiver tuned to an n.f.m. band, the deviation control should be adjusted for a clean-sounding well-modulated signal. It must be remembered that this adjustment holds for one band only and that the deviation control requires readjustment when the transmitter is switched to another band. Less deviation is needed for the higher-frequency bands. More extensive information on aligning n.f.m. units is given in the ARRL *Handbook*.

Total cathode current for the two audio tubes is approximately 1.5 ma. and about 0.5 volt is developed across the cathode resistor of each stage. Plate voltage for the speech-amplifier tube is roughly 30 volts and 25 volts should be measured at the screen-grid pins of both 6AK5s.

Testing the 100-Kc. Oscillator

Power for the 100-kc. crystal oscillator may be obtained only by turning on the transmitter supply. However, the transmitter can be disabled during the test by opening the key. S_2 must be switched to the crystal position and a receiver should be tuned to a harmonic of the crystal. A short antenna connected to the oscillator-output terminal at the rear of the chassis may be necessary if the receiver is tuned to a high frequency and if the transmitter is enclosed in the cabinet. When the circuit appears to be working normally, the oscillator may be brought to zero beat with one of the WWV frequencies by means of C_7.

Plate and screen potentials for the 6SH7 should be 150 and 50 volts, respectively. One volt should appear across the cathode resistor, R_5, and the cathode current is 1 ma.

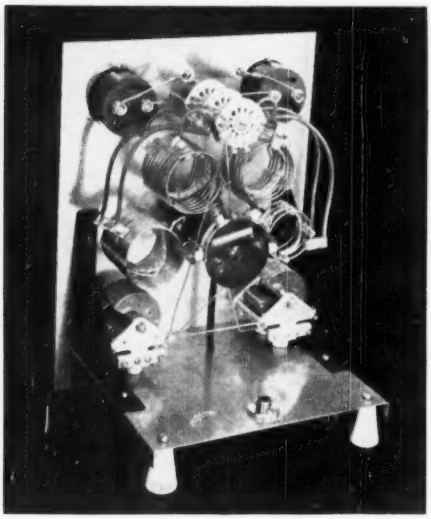
The Antenna Coupler

The circuit diagram of the antenna coupler is given in Fig. 3. The unit makes use of a convenient bandswitching coil assembly and a switching system which permits rapid transfer of the antenna feeders to the correct impedance points on the various coils. The feeder switch has a section, S_{1C}, devoted to the job of shorting out one of the tuning condensers when high capacitance is desirable. The circuit as shown is wired for high-C operation at 3.5 Mc. Laboratory tests have proved that resistive loads ranging from 10 to 3000 ohms can be successfully matched with this parallel-tuned circuit.

Construction of the Coupler

A 7½ by 8¾ chassis deck serves as the base for the antenna coupler. The panel consists of a sheet of Presdwood measuring 10 by 12½ inches backed up by a sheet of aluminum. The tuning condensers are mounted on feed-through insulators at the front of the chassis and the coaxial-cable input jack is at the rear of the deck.

The B & W turret shown in the rear view of the coupler appears in modified form. The 3.5-Mc. coil was eliminated from the assembly and all of the input links were removed from the remaining coils. Two turns were also cut from the 28-Mc. coil. However, all of this was done to permit operation of the tuner with the bandpass trans-



A rear view of the all-band wide-range antenna coupler.

mitter and the particular set of load impedances listed above. It is therefore suggested that the turret be first installed in the original form so that a wide range of circuit values will be available should they be needed.

Using the Coupler

Although the tuner is designed to make band changing as simple as possible, there is nothing unusual about the manner in which it is operated. It is necessary only that the feeder taps be positioned for proper impedance matching and that the input links provide adequate coupling to the power amplifier. There are several methods of making these adjustments. They can be made in the usual cut-and-try manner, using the amplifier plate meter and r.f. meters (if the latter are available) as indicators of proper loading. However, this may not result in best impedance matching. It is preferable to follow the procedure outlined in a recent issue of *QST*.[4]

(*Continued on page 88*)

[4] Grammer, "Eliminating TVI with Low-Pass Filters," *QST*, February, 1950.

U. S. Air Force Reserve

Individuals without prior military service may now be commissioned in the U. S. Air Force Reserve, provided that they have certain qualifications listed below. Former officers of the Army, Navy, and Air Force may be appointed or reappointed in the Air Force Reserve, and subsequently, request active duty. Former airmen who do not have Reserve status may be enlisted in the Reserve in their former grades and volunteer for active duty in those grades. The following opportunities are open to individuals without prior military service, former personnel of the Armed Forces of the United States, and all members of the Air Force of the United States (seeking appointment in a grade higher than that currently held), except Regular commissioned officers of the USAF and USAFR or ANGUS officers on extended active duty in an Air Force of the United States status. Officers holding commission in the Reserve Forces of the Army of the United States, Navy, Marine Corps, Coast Guard, Coast Geodetic Survey, and Public Health Service may not apply for appointment in the USAFR under the provisions of Air Force Regulation 45-15, 23 Sept., 1949, until they have obtained a conditional resignation from their commissions.

1. *Communications Specialists* — Applicant must possess a college degree in electrical, communications, or radio engineering with a minimum of two years of progressive responsible experience with industry in the communication and/or electronics field in any combination of the following: the installation, maintenance, and repair of airborne and/or ground communications equipment involving experience in wire and radio communications, electronics, engineering, miscellaneous electrical and/or telecommunications engineering, including telegraph, telephony, cable, alarm and signal systems, traffic controls and their equipment such as switchboards, dial systems, teletypewriters and facsimile transmitters and/or installation, management and operation of radio stations, telephone systems, and navigational aids or systems. The applicant must currently be employed in one of the above specialties.

2. *Design and Development Officer* — Applicant must possess a college degree within one of the following or associated fields, with civilian experience to demonstrate that he has acquired a thorough knowledge of the physical and mathematical sciences underlying that field. A minimum of one year's experience is required, and the applicant must be working in the field for which applying at the time of application.

Electronics	Nuclear physics
Geophysics	Metallurgy
Engineering	Basic physical sciences

3. *Photographic Equipment Engineer* — Applicant must possess a college degree in engineering with a minimum of three years' experience in the design, manufacture, or repair of cameras, or in the manufacture of optical instruments.

4. *Production Inspection Officer* — Applicant must possess a college degree in the field of mechanical, electrical, or chemical engineering with a minimum of two years' civilian experience in industrial design production.

5. *Special Investigations Technical Officer* — Applicant must possess at least a bachelor degree in the engineering or physical-science field and a minimum of two years' experience in any one of the fields listed below:

Electrical and sound engineering
Analytical chemistry

(*Continued on page 88*)

United States Naval Reserve

GOVERNOR EARL WARREN of California was the guest of Naval Reserve Electronics Platoon 12-19 (K6NAZ) during an Open House held in conjunction with the Fourteenth Annual Youth Day celebration at Winters, Calif., April 29th. Governor Warren and his secretary, Lieut. Cmdr. W. S. Mailliard, USNR, were among the hundreds of visitors to the unit. An additional feature of the Youth Day activities was operation of amateur station W6IHI in an Air Force mobile radio truck. Messages were accepted from the visitors. Sgt. Thourot, USA, manning W6IHI, and Cmdr. B. R. Snow, USNR, W6LTU/K6NAZ, passed traffic to local W6s EXP, OUE, GMP, HWU, ITJ and GHV, who relayed via the Gypo Net (160-meter 'phone), the Mission Trail Net (75-meter 'phone), and c.w. outlets on 160, 80, and 40 meters.

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Nine radio amateurs provided a communications network for the 48th Annual Championship Regatta of the Intercollegiate Rowing Association at Marietta, Ohio, on June 17th. Lieut. Cmdr. Carl J. Anderson, USNR, W8VZ, electronics officer of Naval Reserve Electronics Company 4-4, was in charge of operations. The following amateurs of Marietta and Parkersburg, W. Va., manned stations on 29.6 Mc. from 1:00 to 6:30 P.M. at strategic points indicated: W8VZ, press car on the observation train; W8AWI, IRA steward's car on the train; W8BNH and W8FPC, judge's barge at the finish line; W8DDE and W8ACO, press tent at the finish line; W8MIT, referee's boat; W8FGL and W8BVG, crew boathouses. Equipment was furnished by the Marietta Naval Reserve unit. Naval Reserve Organized Battalion 5-10, Wheeling, W. Va., and individual amateurs. The Wheeling battalion organized a cruise for the occasion. The LSS(L) 65 came down from Wheeling, anchored in front of the finish-line bleachers and provided loudspeaker service for the spectators. The 14th Marine Reserve Communications Company of New York strung a landline along the Ohio side of the river course, from the two-mile mark to the finish line. This Company provided talkers, located at several points along the course, who described the progress of the races over the line. Two sound trucks and the LSS(L) 65 were served by this set-up.

Gov. Earl Warren, California, and Cmdr. Byron R. Snow, USNR, W6LTU, officer-in-charge, pause for cameraman following inspection tour of Naval Reserve Electronics Platoon 12-19, Winters, Calif.

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Naval Reserve Electronics Platoon 9-1, Zion, Ill., set up a portable ham station at Boy Scout Camp, fifteen miles from town, where some 350 Scouts were participating in the annual Lake County Camporee, June 9th-11th. K9NAB/9, operated by W9GYP, maintained schedules with members of the Lake County Radio Club for possible emergency traffic as no telephones were available at the camp. Contacts were with W9FRI, W9RAU, W9VLN, and W9HF on 160-meter 'phone.

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Here and there: Congratulations go to CRE Paul W. Andrew, USNR, W6GUR, who stood highest in the code contest at the Fresno Hamfest, sponsored by the San Joaquin Valley Radio Club on April 29th. . . . Capt. John L. Reinartz, USNR, ex-W1QP-W3RI5, long a familiar figure in Naval Reserve and amateur radio circles, is now located in Burlingame, Calif., where his present station, K6BJ, is control for a network of radio amateur-Reservists. . . . Another old-time ham who continues active in the Reserve is Capt. Thomas R. Pennypacker, USNR, W1VR. . . . The Naval Reserve Emergency Mobile Communication Truck, First Naval District, participated in the armed forces display on Boston Common in connection with the Boston Jubilee and Armed Forces Day, during the period May 14th through 22nd. Amateur operations, under K1USN/1, were supervised by Lieut. J. J. Golnik, USN, W1SUT. . . . The Denver (Colo.) Radio Club holds its meetings (normally on third Wednesday evening each month) at the Naval Reserve Training Center, Denver Federal Center. . . . K5NAZ, Naval Reserve Training Center, Lubbock, Texas, took part in an emergency communication demonstration conducted by the South Plains Radio Club on May 7th. Traffic was exchanged between K5NAZ and low-power (12 watts) portable stations operated on 10 and 75 meters in Abernathy, Texas, by club members. . . . K5NRH, Naval and Marine Corps Reserve Training Center, Houston, has received a certificate of membership in the South Texas Emergency Net. . . . On May 28th, an emergency communication test was conducted by the ARRL Emergency Corps of San Mateo County in conjunction with Naval Reserve Electronics Company 12-7 (K6NAC), San Mateo, Calif. The exercise was conducted under simulated disaster conditions in the San Carlos-Belmont area. Seven mobile radio units transmitted reports to a receiving center in the San Carlos fire station. A dispatch report originated by the San Mateo County Chapter of the Red Cross to the President of the American National Red Cross in Washington was relayed

(*Continued on page 90*)

Safety and Convenience in Transmitters

A Novel Constructional Design for Ham Rigs

BY NATHAN K. BALE,* WØPXZ

DURING the past decade or so, many forms and types of amateur transmitter construction have been suggested in *QST* and other publications. Most of them have had something to offer in the way of original ideas. However, very few of the designs have been directed primarily toward two most important factors, namely, safety and convenience in servicing and adjustment. Few are the hams who wish to keep close company with an electric chair in disguise, and struggling to reach an inaccessible part buried under a chassis never improved one's temperament. Think of the time, energy and patience wasted in disconnecting wires, unscrewing bolts, and tediously pulling out a heavy chassis merely to make some small experimental change in circuit or component. With a little thought and some planning, these handicaps can be quite readily overcome.

The type of construction used in the 250-watt all-band rig shown in the photographs is not expensive and all of the material is of standard make, usually available in hardware stores, radio-supply houses, and metalworking shops. The design can be fitted to accommodate many existing rigs with only moderate alterations. The outstanding features are that the transmitter is completely enclosed as a measure of safety and that all servicing and changing of plug-in coils can be made conveniently and safely from the front. Any unit can be quickly removed if a major operation becomes necessary. The cost of this enclosed structure is no greater than that of the usual open-rack job. It is practically dustproof and the cabinet provides a good measure of shielding against direct radiation. The finished product is neat and professional in appearance.

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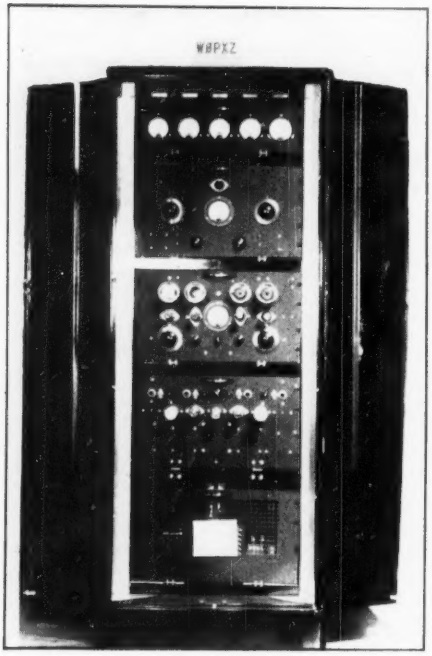


The hinged-panel rig ready to operate.

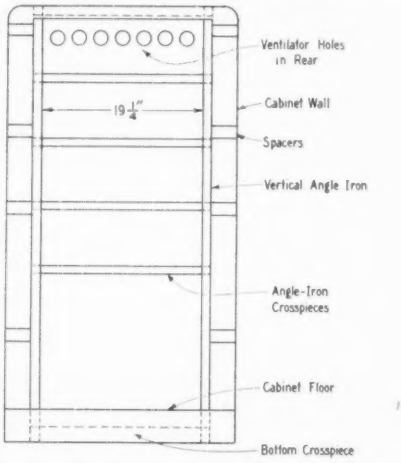


Fig. 1 — The utility cabinet is strengthened by an interior framework of angle iron.

Frame Construction

The dimensions are based upon the measurements of a kitchen utility cabinet of the type sold in all department stores and mail-order houses. They are available in several different sizes. This one is 64 inches high, 25 inches wide, and 12 inches deep — large enough to accommodate a good-sized transmitter.

The cabinet is strengthened by an interior framework of angle iron. The shelves must be pried out first, of course. Holes are cut in the sheet-metal bottom of the cabinet to allow the vertical members of the frame (2 × 2-inch angle stock) to run from the floor level to the top of the cabinet. These two verticals should be spaced apart a quarter of an inch more than the width of the panels to be used. If the panels are of standard

19-inch width, the two uprights should be spaced 19¼ inches. They are bolted to the sides of the cabinet, using spacing blocks or sections of small-diameter pipe between the cabinet wall and the angle iron, if necessary, to make the panel space suitable, as shown in Fig. 1.

The framework should be placed far enough to the rear of the cabinet so that the doors will clear any projecting parts that may be mounted on the panel fronts. To improve the appearance from the front, any space between the sides of the cabinet and the vertical members can be covered with strips fastened to the angle stock. I used aluminum, as the photographs show, and it makes a good-looking job.

The bottoms of the uprights are joined by a length of 2 × 2-inch angle stock and crosspieces of 1 ½ 1-inch angle iron are bolted to the verticals

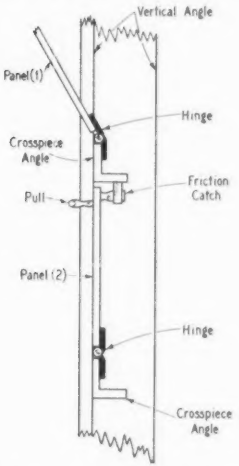


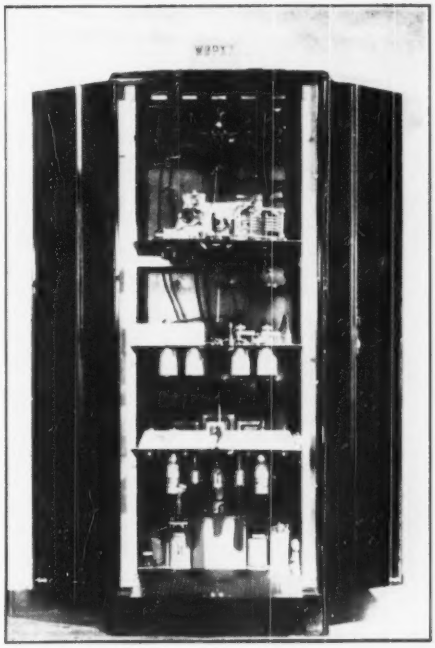
Fig. 2 — Method of mounting the hinged panels.

so that the top edge of each crosspiece will come about ⅛ inch below the bottom edge of the panel above it. If desired, the vertical members may be drilled at some standard interval so as to provide for future modification.

The Hinged Panels

The bottom edges of the panels are hinged to the crosspieces, as shown in Fig. 2. The hinges are of the "slip-pin" type, miniature versions of the common door hinge. To remove an entire unit from the rack, all you have to do is slip out the two pins and the panel is free. The original hinges on the doors of the cabinet should also be replaced with hinges of this type (or removable pins substituted in the original hinges), so that the doors can be removed if desired while working on the transmitter.

Each panel is fitted with a drawer pull to facilitate opening and is held securely closed by a standard friction catch. The male part of the catch is

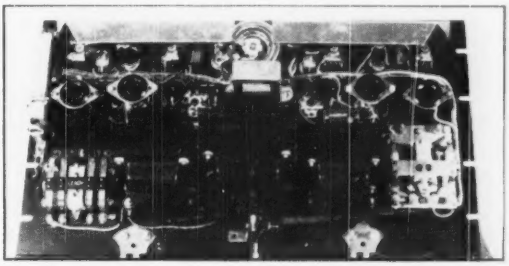


The components and wiring of this transmitter are readily accessible from the front. Safety interlocks make it impossible to expose dangerous high-voltage points with the power on.

fastened to the panel at the center of the upper edge, while the matching female part is attached to the crosspiece above. To hold the panels in a horizontal position while they are open, a cord fitted with a hook is attached to the panel after it has been opened. The other end of this cord is fastened permanently to the framework.

Several large socket-punch holes should be made in the back of the cabinet near the top to provide ventilation.

Ordinary panel-and-chassis construction may be followed, providing the depth of the chassis behind the panel is less than the panel height. If the chassis depth is greater, it may interfere with the unit above when it is hinged outward. However, components can be made much more ac-



The exciter power supply. A typical example of chassisless construction.

cessible by mounting everything on the panel — on front as well as on the back, as I have done except for the final power supply because of its weight. This unit is, however, built with all wiring on top where it can be reached easily when the hinged panel in front is opened.

Nothing that exposes a high-voltage point should be mounted on the front of the panel. Small plug-in coils may be mounted in front if they are protected with shields. All milliammeters are connected in the cathode or filament center-tap circuit to remove the hazard that might otherwise be presented by the adjusting screws.

All power connections and r.f. connections between units are made through a system of flexible cords or lines and plugs, so that it is a simple matter to make and break connections when a unit is to be removed.

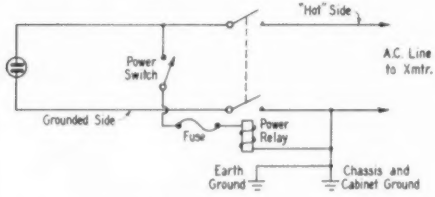


Fig. 3 — Another safety feature is the circuit that assures a ground connection to the cabinet.

Each of the panels is fitted with a microswitch that is pressure-operated when the panels are opened or closed. These safety interlock switches are connected in series so that opening of any one of them will break the coil circuit of a power relay that controls all plate voltages to the transmitter. In addition, the final amplifier panel is fitted with a simple homemade device that short-circuits the high voltage when the panel is opened. This gadget is adjusted so that it doesn't make contact until slightly after the interlock opens and breaks contact slightly before the microswitch closes. The a.c. lines to the filament transformers, to the power relay, and to the plate transformers are protected with individual fuses.

Another safety feature is the circuit, shown in Fig. 3, that assures a ground connection to the cabinet. The power relay cannot be operated unless there is a ground connection to the cabinet. The plug must be correctly polarized with respect to the line, otherwise the power relay will not function.

The cabinet can be repainted any color to suit, if desired. I painted mine black which looks good enough for any living room or den. When the doors are closed, the rig is very inconspicuous. And you know how important this is from the XYL's point of view!

HAMFEST CALENDAR

NEW JERSEY — Sunday, September 10th, at Walworth Park, Haddonfield — South Jersey Radio Association Hamfest. Two-meter transmitter hunt, games, pony rides for the kiddies. Bring the whole family. In case of rain affair will be held September 17th.

High Claimed Scores — 1950 Field Day

Listed below are high claimed scores reported for the Fourteenth ARRL Field Day, June 24th–25th. These are subject to checking and grouping according to the number of transmitters in simultaneous use at each station. Complete FD results will be published in a later issue.

Class A

(Listings show call used in FD, claimed score, and number of simultaneously-operated transmitters.)

Mid-Cities Amateur Radio Club	W6GAL/6	19,773–12
Garden State Amateur Radio Assn.	W2GSA/2	12,552– 8
Concord Brasspounders	W1OC/1	12,492– 9
Northwest Amateur Radio Club	W9IT/9	11,916– 8
Tri-County Radio Assn.	W2OM/2	11,727– 7
Frankford Radio Club	W3FRY/3	10,575– 5
Ohio Valley Amateur Radio Assn.	W4FU/8	9936– 4
Associated Radio Amateurs of Long Beach	W6HO/6	9882– 7
North Suburban Radio Club	W9AP/9	9720– 7
Oakland Radio Club	W6OT/6	9630– 9
Potomac Valley Radio Club	W3USA/3	9099– 8
Central Jersey Radio Club	W2AI/2	8838– 4
Lakeland Amateur Radio Assn.	W2VDJ/2	8523– 6
Inglewood Amateur Radio Club	W6MSO/6	8091– 5
Sommerset Hills Radio Club	W2HXM/2	7641– 6
West Side Radio Club	VE3JJ/3	7587– 8
Hamilton Amateur Radio Club	VE3BNG/3	7578–10
St. Paul Radio Club	WØRA/Ø	7578– 2
Amateur Radio Club of Hollywood	W6JM/6	7560– 7
Beaver Valley Amateur Radio Assn.	W3GJY/3	7425– 6
Society of Amateur Radio Operators	W6AEX/6	7362– 7
Soledad Amateur Radio Club	W6GER/6	7164– 8
Helix Amateur Radio Club	W6MGJ/6	7155– 9
West Seattle Amateur Radio Club (nonclub group)	W7RT/7	7155– 5
Electric City Radio Club	W9EDK/9	6813– 4
Mike and Key Club of Santa Monica	W3KX/3	6696– 7
Ridgewood Radio Club	W6VB/6	6507–
York Radio Club	W2ZT/2	6480– 6
Michiana Amateur Radio Club	W9CWP/9	6363– 5
Cedar Valley Radio Club	W9AB/9	6318– 5
Egyptian Radio Club	WØBYF/Ø	6309– 3
Clinton Amateur Radio Club	W9AIU/9	6066– 2
Northern New Jersey Radio Assn.	VE3BER/3	6048– 8
	W2DAY/2	6039– 4

Class B

(Listings show calls of operators at each station, call used, and score.)

W1s ORP HFO	W1ORP/1	4347
W2s JBQ FBA	W2JBQ/2	4172
W6s GTM HQM	W6GTM/6	2997
W9s QFH ZWN	W9QFH/9	2754
W9FAU	W9FAU/9	2565
W8s QV EBJ	W8GW/8	2511
W3s MCG MFJ	W3MCG/3	2433
W5s CA FVO	W5CA/5	2169
W9s UKT IU	W9UKT/9	2133

Class C

W6MBA/6	4077	W6FEL/6	1201
W6KNH/6	2119	W5DAH/5	1147
W6SCX/6	1458	W2VBH/2	1147
W6GJC/6	1417	W6EXB/6	1093
W6EPX/6	1390	W6ZVD/6	1039
W2GFG/2	1350	W6LSN/6	1026
W6UG/6	1323	W2HF/2	1026
W2BRJ/2	1233		

Class D

W9DUA	369	K2CC	138
W4NRO	230	W6IAM	132
W8TZO	163	W2HY	104

SOME of the single-sideband gang who use big tubes have wondered what the FCC interpretation on the s.s.b. power limit is. We are pleased to quote the following from a Commission letter addressed to the League:

> The following . . . may be considered as a presently acceptable method for determining the d.c. plate power input to the final r.f. stage of a single-sideband amateur transmitter:
>
> The maximum d.c. plate power input to the radio frequency tube or tubes supplying power to the antenna system of a single-sideband suppressed carrier transmitter, as indicated by the usual plate voltmeter and plate milliammeter, shall be considered as the "input power" insofar as Sections 12.131 and 12.136(d) of the Commission's rules are concerned, provided the plate meters utilized have a time constant not in excess of approximately 0.25 second, and the linearity of the transmitter has been adjusted to prevent the generation of excessive sidebands. The "input power" shall not exceed one kilowatt on peaks as indicated by the plate meter readings.
>
> T. J. SLOWIE
> *Secretary*

A number of new ones have popped up in the last few months, but unfortunately many of them seem to be much better with a soldering iron and microphone than with a pen. How about some reports from you holdouts? We would like to get your call down on the record, so you can show your grandchildren at some later date how you were one of the first on s.s.b.

It may take a little time, however, before Denny at **W2URX,** Glen Cove, N. Y., will be showing his grandchildren how he pioneered the stuff. Oh, he's on the air with a rig all right, doing quite nicely with a **W2UNJ** exciter driving AB_2 807s to 120 watts on 75 and voice-controlled break-in for duplexing. His problem is that he's only 17 years old, a senior in high school, and it may be a few years before he has any grandchildren! But he sure makes it tough on some of the smart oldsters who steer clear of s.s.b. because "you have to be an engineer to make it work." Denny has made enough direct comparisons of his 120 watts s.s.b. and 120 watts a.m. to be completely sold on the carrierless stuff. Best DX is **W6CH.**

Those on the track of their s.s.b. WAS will do well to look for **W8RMH** in Detroit, the first one on from Michigan. Ed uses a phasing rig ending up with p.p. 813s in the final, running 500 watts on 75 and 20. He says that **W1JEO/9** is on s.s.b. in Indiana with a six-tube portable rig using a crystal filter. The thing winds up in an 807 and the filter has 38 db. sideband suppression — we'll try to get more dope for you on this job next month.

Another one for the WAS seekers is **WØAHM** at Great Bend, Kans. John uses a phasing rig made up from ideas gathered from several articles, and the exciter drives the 807 in his HT-17 on 75 meters at present. The exciter is built on an 11 by 7 by 2 chassis and has push-button control for sideband selection and carrier reinsertion. It took two weeks of spare time to construct, and John says it gave less trouble than anything he ever built. He's sure that anyone buying a commercial phase-shift network could align a s.s.b. exciter with only a receiver and its S-meter.

Bob of **W3KPP,** in Pittsburgh, has been on 75 for a few months, running 40 watts to an 807 in a filter rig. During that time he has worked about 40 s.s.b. stations in all W districts except the seventh. While this isn't the lowest-powered 'phone rig that has been on, it certainly has a record that hasn't been equaled, to our knowledge. Or is that sort of performance routine for a 40-watt a.m. rig?

W2SNQ in West Orange, N. J., uses a phase-shift exciter on 5.2 Mc. and a 9-Mc. VFO for 20- and 75-meter operation. The exciter ends up with a 6AG7 that drives Class A 304TLs in the final. The exciter unit is all miniature tubes, except for the 6AG7.

Faithful readers of *QST* may recall some of the circuits Hank Keen, **W2CTK,** of East Hempstead, N. Y., used to dream up. Hank has had a phase-shift rig on 75 since April, using a quartet of screen-modulated 807s running about 200 watts peak input. The audio amplifier before the phase-shift network has 250-cycle high-pass and 3000-cycle low-pass filters and a clipper, and a pair of 6L6s does the modulating. The antenna is a 30-foot vertical resting on a pop bottle and fed by a buried coaxial line. Hank confirms the almost universal observation that it is nice to be able to reinsert carrier at the transmitter, until that great day comes when all ham operators can (1) identify, and (2) tune in a single-sideband signal.

W4OLL has a new Class B 304TL which he says "really woofs up to the limit." He is still using his filter, but has plans for working on a crystal-lattice filter at 163 kc. in the near future. . . . **VE7VP** worked **VK2CP** (14,370) when **VK2AC** was also at the station. VK2AC, you may recall, has a crystal-filter s.s.b. rig on 7 Mc. — it is described in the June, 1950, issue of *Amateur Radio* (Australia). . . . **G2NX** (14,360), who also uses a crystal-filter rig, was heard by VE7RV. . . . The June 18th *Newark* (N. J.) *News* carried a nice story and picture of the s.s.b. rig at **W2ESP,** which prompts us to point out that a s.s.b. station makes a good news story for any local paper, with consequent favorable publicity for ham radio. The angle of the extended range possible with s.s.b. is a natural, particularly if you can give the reporter some before-and-after figures.

If your stumbling block on a s.s.b. rig is the matched resistors and condensers for a phasing

(Continued on page 90)

A Dual-Crystal "Q5-er"

More C.W. Selectivity with Two Filter Crystals

BY REGINALD A. TITT,* EX-G3CMJ

Most readers will be familiar with the characteristics of the single crystal filter and also well aware of its weaknesses. The width of the skirts of the response curve and the fact that the rejection slot permits the elimination of only some of the adjacent interference are both reasons for the present interest in cascaded low-frequency i.f. stages and double- and triple-conversion jobs.

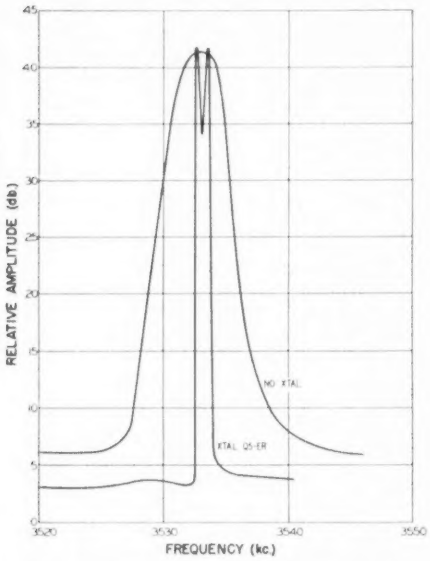


Fig. 1 — Selectivity curves of the dual-crystal filter, compared with the normal i.f. selectivity. The scales represent S-meter readings and frequency calibrations on an RME-45.

However, these disadvantages of the single crystal filter can be overcome and most of the advantages of the conventional "Q5-er" can be obtained by a simple modification of any existing crystal filter, resulting in a near-perfect response curve for c.w. reception. No outboard attachments are needed, no additional power supplies have to be found, and the modification is done inside the crystal filter assembly of your present receiver, leaving everything quite neat and tidy. No new parts are required, apart from the purchase of two i.f. crystals, and thus the over-all cost is low.

The response curve of the normal single crystal filter is familiar to everyone, taking the form of a sharp peak with a rejection notch on one side or the other, depending upon the setting of the phasing condenser. If we take two such curves, one being the mirror image of the other, and superimpose them so that the peaks are close together but not quite coincident, the resultant curve has a narrow passband and steep sides. The rejection notch of one crystal furnishes one steep side, and the rejection notch of the other crystal supplies the other steep side. A response curve of this type approaches the ideal for c.w. reception. Fig. 1 shows such a curve, plotted from readings made on an RME-45 with and without the dual-crystal Q5-er.

Practical Considerations

To convert an existing filter, it is only necessary that two crystals be used in the usual filter circuit, as shown in Fig. 2. The two crystals should be identical except as to frequency. Within limits, the frequency separation determines the width of the response curve. In practice it was found that a pair of crystals around 300 cycles apart is about right for c.w. To obtain this separation, 455.15- and 454.85-kc. crystals would be paired in a nominal 455-kc. i.f. amplifier, although one could use crystals several kilocycles away, provided they differed by about 300 cycles and the i.f. amplifier were realigned on the new mid-frequency. Crystals in the i.f. range can be obtained from crystal suppliers inexpensively. Surplus crystals should work satisfactorily, but they were not tried and consequently no definite statement can be made about their performance.

The conversion of the filter in my RME-45 was done by removing one of the resistors connected

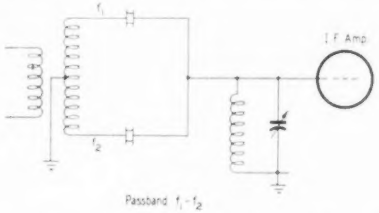


Fig. 2 — Basic circuit of a dual-crystal filter. The passband of the filter is determined by the frequency difference, f_1 f_2, of the two crystals.

to the variable-selectivity switch and replacing it with the second crystal, as shown in Fig. 3. This makes it possible to switch in one, two, or no crystals. In practice the single crystal is virtually never used, as its performance does not compare with the dual-crystal Q5-er.

* 9b Westway North, Baltimore 21, Md.

In Fig. 3, C_1 is the normal phasing condenser, while C_2 is a small condenser that may be added to balance the capacity of the second crystal holder. In the RME this balance is arrived at by adjusting C_2 until the receiver noise is at a minimum. (This is a tricky adjustment, since the noise level is very low with the dual filter.) The little dip between the two crystal peaks is not noticed in practice, and it may even be flattened by adjustment of the phasing condenser. The phasing condenser can still be used for its normal purpose, and its effect is to change the contour of the skirts of the curve, allowing some additional rejection of very strong unwanted signals.

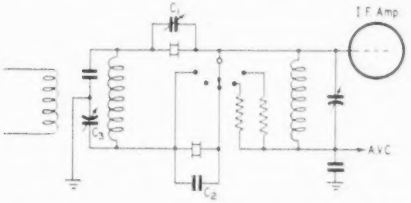


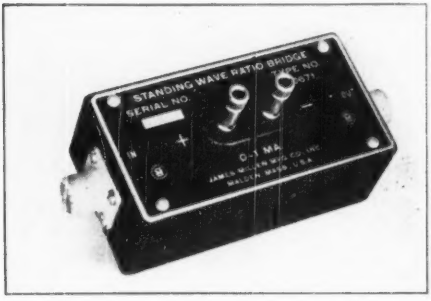
Fig. 3 — **Revamped crystal filter circuit of an RME-45, modified for single- or dual-crystal operation.**
C_1 — Normal phasing condenser.
C_2 — Small fixed condenser, 0 to 10 $\mu\mu$fd. See text.

The i.f. stages should, of course, be aligned to the mean frequency of the filter crystals, and here the displaced 455-kc. crystal from the filter can be used in a simple oscillator circuit as a handy signal generator, provided, of course, that your two new crystals straddle the frequency of the old one.

That's all there is to it. No more expense, and no more trouble. This is not a new idea, although on this side of the Atlantic this use of crystals in pairs seems to have been neglected.

New S. W. R. Bridge for Coax Lines

For anyone who uses coax cable, whether to feed an antenna or as a circuit link, an s.w.r. bridge is practically an "indispensable." Heretofore it has been necessary to make your own, but there is now available a commercially-built version, put up in a small package which makes it a convenient instrument to use. Based on a design by John Smith, W2TW, it is of the resistance type and may be adapted to either 52- or 75-ohm line.



As shown in the accompanying photograph, the container is a rectangular shielding case fitted with coax terminals on both ends. Socket-type binding posts are provided on top for connecting a 0–1 ma. meter (you use your own meter) and a plug fitting the posts is furnished. The case measures 4¼ by 2¼ by 1⅝ inches. As assembled, the bridge is set up for 52-ohm line, but a calibrated 75-ohm resistor is mounted inside the case and can readily be substituted in the circuit when 75-ohm line is to be checked. A calibration curve showing standing-wave ratio against meter readings on a 0–1 scale is furnished.

The new bridge is made by James Millen Manufacturing Co., Malden, Mass.

Strays

W and VE radio amateurs professionally employed as movie projectionists or stage hands and affiliated with IATSE are requested to forward their name, call, and mailing address to Amos Kanaga, W6BAA, 623 Capuchino Drive, Millbrae, Calif., for listing in a directory to be published by *International Projectionist and Independent*.

—···—

An informative 12-page circular, *Solders and Soldering*, which describes in detail types of solders and soldering procedures, has just been published by the National Bureau of Standards. The three classes of solders treated are soft solders, precious-metal solders, and common brazing solders. The selection of fluxes, which can be as important as the choice of solder, is also adequately discussed. Copies of this publication, known as Circular 492, *Solders and Soldering*, are available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 15 cents each.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C.W.	*'PHONE*
7100 kc. (day)	3875 kc.
3550 kc. (night)	14,225 kc.
14,050 kc.	

During periods of communications emergency these channels will be monitored by stations of the National Emergency Net for personal-inquiry traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

{Continuing the ARRL Series on Amateur Operating}

Working DX

BY BYRON GOODMAN, W1DX

THE term "DX" is derived from the radio abbreviation for "distance," and in the cold gray dawn of amateur "wireless" it meant just that. In those days of spark, "working DX" was raising someone in the next town or as far away as a thousand miles, depending on the power available. But with the development of c.w. and the higher frequencies — "short waves" then — international communication became possible, and "DX" came to mean working stations in other countries, across an ocean, and even on the other side of the world. The term still means any extraordinary range, such as working across the continent with only a watt or two, or covering several hundred to several thousand miles with v.h.f. equipment, but this article will consider "DX" as it is understood by most: the working of foreign stations.

The lure of DX is as old as amateur radio itself, whether it be the original desire to work just a little farther than other stations, or the present competitive concept of collecting a few more different countries than the next fellow. Disregarding the competitive side, there is a wonderful thrill of satisfaction just in knowing that the signal from your station has carried thousands of miles to some distant receiver where the country and people and everything else are foreign, except the common bond of amateur radio. You begin to realize that the world is big — and that

"...THERE ARE OTHER KINDS OF PEOPLE"

there are other kinds of people. The operator you are talking to may be relaxing after supper, while you are just sneaking in one last QSO before heading for work. He may be dressed in shorts, in a muggy tropical climate, while you worry about the ice forming on your antenna. He may apologize for his weak signal on the grounds that all of the radio gear in his shack was packed inland 600 miles by native bearers. Or he may turn out to be a friend of that "foreigner" you went to school with. Few operators crash the ranks of the legendary "super DX men," just as few athletes ever reach the champion class, but almost anyone can enjoy the satisfaction of working stations in foreign countries, unless he is handicapped by an "impossible" location. But fortunately, such locations are rare, and even small indoor antennas have been used with good results by persistent operators.

As in any radio operating, under adverse conditions it is generally the station with the best signal that gets through, but high power and superb antenna systems are far from essentials in working DX. While a cool kilowatt and a high-gain antenna are nice to have, as they are in any type of operating, for DX it is far more important to be able to spot your transmitter frequency *exactly* where you want it in the band. Also, if you have to throw more than one switch to go from "receive" to "transmit" you will be wasting valuable time and motion and thus jeopardize your chances of raising the DX station. Naturally you will want a good receiver, situated so that your hand won't cramp up after a few excursions up and down the band. In fact, your operating position should be just as comfortable as you can make it, because DX chasing takes time. Another useful device for chasing DX is a loud alarm clock or a bad case of insomnia, because often the queer hours (your time) are the most productive ones DX-wise.

Bands and Times

Obviously, for success in working DX you have to be on the air at the times that the paths are open to foreign countries. Knowing what times and bands are best is something one gains from snooping and experience and swapping information with other DX-minded operators. You can expect to find some DX on 3.5 Mc. in the winter over a darkness path. East Coast amateurs work Europe and Africa around midnight, and occasionally Oceania will come through just before dawn. West Coast amateurs find the best time for Oceania and Asia to be in the early-morning hours before dawn.

The DX on 7 Mc. is best during the winter, spring and late fall. It is quite possible to work all continents on this band, although it isn't as easy as on the higher frequencies. The signals follow the darkness paths, but one or both ends of the route can be in dawn or dusk. Dawn and dusk periods generally provide chances to work the greatest distances, but any of the dark hours may offer opportunities to work DX.

The 14-Mc. band bears the brunt of most DX operating, because DX often can be worked practically around the clock. The best times for any particular path depend upon the time of the year, with the summer months offering the greatest number of "open" hours and the winter the fewest. However, the winter, fall and spring months often provide the best signals over difficult paths, particularly when the band is just "opening" or "closing" during the dawn and early-evening periods.

The 28-Mc. band is the low-power man's friend, because excellent signals can be put through with little power when the band is "open." The band is at its best during the winter months over daylight paths. A three-element rotary beam is a big help because it confines the radiation to the necessary low angle. Beams aren't an absolute necessity, of course, but they are very useful, and on this band they don't require much space. The band isn't good every year, though, and during the summer it is generally worthless for DX.

For any particular locality the best times for working DX vary so widely with the year and time of year that it is possible only to lay down the very general rules given above. However, there are several ways to obtain more specific information. One is to ask a local amateur who is quite active in DX work. Another is to do a lot

of "snooping" on a band and find out for yourself, or to see when the locals are calling DX. If they are hearing it, the path is open, although the DX signal may be weak and you may not spot it at first. If you miss hearing several stations that are being called by locals, your receiver or receiving antenna may be at fault and will bear investigation. However, don't get too excited if you don't hear all the rare stations some particular local station calls. He may have a better antenna, a better location or more experience than you.[1]

Antennas

A knowledge of your antenna pattern and the direction of maximum radiation is quite useful in appraising your chances for success in working DX. The subject is covered well in other literature,[2] and is beyond the scope of this discussion. To apply the information, however, you should acquaint yourself with the true direction of the various areas of the world with respect to your station. A globe and a piece of string will give you this information, or you can use one of the "great circle" (azimuthal) maps that have been drawn for various parts of the country. Some of these maps are reproduced elsewhere,[2] or you can buy one centered on Washington or San Francisco from some marine supply stores. The latter are prepared by the U. S. Navy Department, Hydrographic Office. The *A.R.R.L. Amateur Radio Map* is centered on Kansas.

If you use a rotary beam, you can use a great-circle map on your direction indicator, to have the necessary information at your fingertips at all times. If you have a 14-Mc. rotary beam, the best path is not necessarily the shorter one as indicated on a great-circle map, and it is wise to swing your beam 180 degrees and check by listening before you decide your beam is aimed correctly. This holds true most frequently for long-range paths over 8000 or 10,000 miles. On 28 Mc., the daylight path is practically always the correct one, although during the spring and fall equinox periods signals may come "the long way around" over distances of up to 16,000 miles or so.

Common DX

It isn't too difficult to work stations in foreign countries where there may be hundreds of active amateurs, such as England, Argentina, Brazil, South Africa, Australia, New Zealand and the like, particularly when there are a number of them "coming through" at one time. Although almost any foreign station may get several replies to his "CQ," your chances of raising him are much better than if a score or more stations call him, as is often the case when a "rare" piece of DX calls "CQ." So far as actual *distance* is concerned, these common stations represent just as good DX as a rare station at a similar distance. You will find them to be just as good operators as your W and VE friends, and often some very interesting rag-chews will develop. You will get a broader slant on conditions in other parts of the world through contacts with these foreign stations, and you will help to generate international good will by your exchanges of experiences and opinions. You can never tell when one of these foreign amateurs may get the opportunity to visit your country and, if he does, he is almost certain to visit you for a personal QSO if he has pleasant memories of your over-the-air chats.

Your first job in working a DX station is to hear him. If you are on a band at a time when DX is likely to be coming through, listen around for a while to see what you can hear. Find out what the other fellows are working, and check any signals that aren't so loud that they are obviously W stations. Look in the "holes" and look near and under the Ws. Investigate signals with peculiar characteristics and a hollow or fluttery sound, but don't expect all DX signals to sound as though they have traveled a million miles. Since the DX signals represent only a small percentage of the signals you will hear (except at certain times on 28 Mc.), you have to look a little more carefully than when you are willing to work the first W you hear who isn't smothered by QRM. Make notes of the frequencies and signals of the DX stations you hear, so that you can

[1] The scientific way to determine the best times for working DX is to subscribe to the monthly CRPL-D prediction charts prepared by the National Bureau of Standards. Using these you can plot the "open" hours for any particular path for any frequency, bearing in mind that they represent average conditions over a month and that there will be variations. However, they work out very well and are a useful tool. Unfortunately, even the Bureau of Standards cannot guarantee that there will be amateurs active at the distant point when the path is open!

[2] *The A.R.R.L. Antenna Book.*

keep track of a number of them. Remember that many foreign countries allow amateur operation only in the low-frequency halves of the 7- and 3.5-Mc. bands.

If the DX station you first elect to call is in the middle of a CQ, note carefully if he gives any indication of how he plans to tune. On c.w. he may say "U5" or "D10," meaning he will listen "up 5 kc." or "down 10 kc." from his frequency. If he doesn't indicate where he plans to start tuning, he is probably going to listen near his own frequency first, so that's where you want to call him. Not right on his own frequency, because a long call by you may cover him up if someone else raises him, but anything from 500 cycles to several kilocycles to one side, if you're on c.w. Don't expect this article to tell you which side — that's where chance enters the picture — but if you're the only station calling, or if he likes your signal the best, you will raise him. On 'phone, your best bet of course is to call him on or near the frequency he indicates as the start of his tuning. If he doesn't mention where he is tuning, call him from somewhere near the edge of your subband or from some hole where there is a fair chance of your not being covered up by other Ws.

When calling near the frequency of the DX, it isn't necessary to make your call a long one. Time your call to correspond with what you guess it might take you to tune across 5 or 10 kc. once or twice. If you can work break-in, you will save a lot of unnecessary calling time.

If you don't raise the DX station, find out whom he did come back to, to get a check on his listening habits. Govern yourself accordingly the next time you call him, but in the meantime

check up on some of the other DX stations you have spotted. One of them may be calling CQ or just finishing a QSO.

When the DX station you elect to call is just finishing a QSO, you know where his receiver is tuned — to the frequency of the station he's working. Put your transmitter on or within a few hundred cycles of this frequency — you have to guess under some skip conditions — but not right on top of the DX station. Give the DX station a very short call when he has finished — as indicated by the "SK" in his transmission — and you have a good chance of raising him. If he doesn't come back to anyone, try another *short* call. A long call is unnecessary, because you know where his receiver is tuned.

Some calls never stand a chance. For example, if you are on the East Coast, there will be times when the Europeans you call will only come back to W6s, even though the Europeans are loud at your location. This merely indicates that the Europeans are more interested in working W6s than they are W1s and W2s and W3s, so the smart — and courteous — thing to do is look for some DX that is interested in you. *Don't* start rebuilding your antenna!

Often you will be able to raise DX by calling "CQ DX," but you have to exercise some judgment as to when to use it. It is quite productive on 28-Mc. 'phone and c.w., especially when the band is just beginning to open over some particular path, and it will work on 7 and 14 Mc. Obviously, however, if every W station calls "CQ DX" at the same time, many are going to be doomed to disappointment. You also have to reconcile yourself to the fact that you can't be combing the band for DX while you're calling "CQ," so the time may be wasted. If you have an outstanding signal you may get a fair percentage of replies, but don't overdo it unless you want to be tagged a "CQ hound." If you do call "CQ DX," be prepared to work any DX station that calls you, otherwise it won't be long before you will be accused by the far-off stations of having "tin ears" and they won't bother to call when they hear you.

The duration of a QSO with a DX station depends entirely on the foreign station. If many stations are coming through from his country, you aren't being selfish by holding a long ragchew, if the DX station indicates his willingness to talk. However, on 3.5 Mc., where there are seldom very many DX stations coming through and the "open" time is relatively short, it is only common courtesy not to hold him, since he is probably as anxious to work as many stations while the band is good as the other stations are eager to work him.

In general DX operation of this nature, you may occasionally be requested by a foreign station to handle some third-party traffic to someone in this country. It is forbidden to handle third-party traffic except with Canada, Chile, Ecuador, Peru and United States possessions and occupied territory, and so you may have to decline as gracefully as you can. However, when you do run across some permissible long-haul traffic, by all means accept it and expedite its delivery in every way possible. Traffic of this nature represents real service and is often the first word the addressee has received from the sender in months.

You may run across an expedition that is licensed to work amateurs. (*QST* and the W1AW bulletins carry up-to-the-minute information on such ventures.) If the expedition is from one of the countries with which we have a traffic agreement, you can handle any expedition traffic that comes your way. Such opportunities for service are welcomed by most operators.

However, one should be careful not to work any station signing a non-amateur call, no matter how alluring the letter combination, unless it is definitely known that the station is licensed to work amateurs, since this can be cause for a citation by the FCC and a black mark on your record.

Rare DX

The term "rare DX" is, of course, only relative. To an operator who chases DX only a few hours a year, any foreign station is "rare." On the other hand, someone who is out to work as many different countries as he can, for self-satisfaction or an ARRL DX Century Club Certificate or other operator award, may consider some country he hasn't worked as "rare," once he has a good start toward his goal. A PK or VS6 may be a choice prize to a W1 or VE1 who doesn't hear very many, but the W6 who has a dozen cards from these countries considers them routine.

There is only one thing that makes rare DX harder to work than common DX over approximately the same path and distance, and that is competition. When a rare DX station calls "CQ," he is likely to be called by at least five or ten

stations the first time. Such a commotion in the band is bound to attract attention, and by the time the DX station has finished his first QSO there may be from twenty to fifty stations lined up to call. To get the DX station to come back to you obviously requires skill, patience and luck.

The principles outlined under working common DX also apply to working the rare ones, but with a few more refinements. First you have to hear the station. You do this by spotting him (you hope) during his opening CQ or by hearing him being worked or called. It will take you longer to locate the rare ones because there are fewer of them on the air, and if extra-special DX is your objective you have to resist the temptation to call something that isn't rare for you. Just combing back and forth through the band until you spot something of interest requires considerable patience. Stations capable of putting outstanding signals into far corners of the world sometimes raise rare stations on a "CQ DX," but the odds are all against it. The time-proven approach is to listen, listen, and listen again.

Choosing the frequency for calling the rare DX station isn't an easy matter, because you are likely to be up against considerable competition. Finding out for sure where the DX station is listening will raise the odds in your favor a little, because some operators calling DX get into a rut and always call right on the frequency of the DX station. If the DX is smart, he won't come back to a station exactly on his own frequency because he knows that soon the whole pack will be calling him there and blanketing him. However, if the DX station insists on replying to stations exactly on his own frequency, you have no choice but to call him there, because that's where he's listening. If he signs "D5" or "U10," swing down (or up) to the indicated spot and call. Your chances will be good, because it isn't likely that everyone will call from exactly the same frequency, and you may be the one to be in the clear. Break-in is generally impossible to use with a DX station that is being called on his own frequency by many stations, but it is useful to have for the smarter DX operators who only work stations off their own frequency.

The length of the call will vary considerably, since it will depend upon the operating and tuning habits of the DX station. Good foreign operators are quite likely to reply to a short snappy call, while less-experienced ones may sometimes wait out the majority and answer the longest call, when all of the calls are made on practically the same frequency. This latter practice is unfortunate, because it doesn't take long for the other Ws to notice it and lengthen their calls, too. All of this is just a waste of time that could easily be avoided by the DX station tuning around until he finds someone in the clear who makes only a short call. There is no dead-sure way to raise the rare DX station, but it will help if you study his listening habits and govern yourself accordingly.

In working rare 'phone DX, the technique is much the same as for common DX, except that here again the competition is much keener and you have to be more observant. Find out where the DX station listens, try to guess how he tunes, and your percentage of QSOs will go up. In going after the rare ones, you will have quite an advantage over your less-accomplished competition if you can speak several languages other than English. French and Spanish are generally the most useful.

Occasionally you will run across a rare DX station that is being "passed around" or "booked." The practice consists of a W, who is QSO the rare station, asking the DX to "please listen for my friend W-so-and-so on X frequency." There was a time when such a practice could readily be condoned — the QSO might give the friend his coveted WAC or similar award — and there is certainly no objection today if the DX station is a common one, and not being waited for by scores of others. But to request a rare DX station to "look for a friend" is generally an open invitation these days for the waiting stations to show no respect or cooperation and to call the

(*Continued on page 92*)

Push-Button Power Control Circuits

BY VINCENT W. HANSEN,* WØFUL

It has always seemed to me that hams were missing a good bet in not adapting the push-button motor starter circuits to transmitter control. Electrical locking relays offer a degree of simplicity, flexibility, and compactness not easily achieved by other methods and, in addition, protective devices for both the operator and the equipment are easily included in the system.

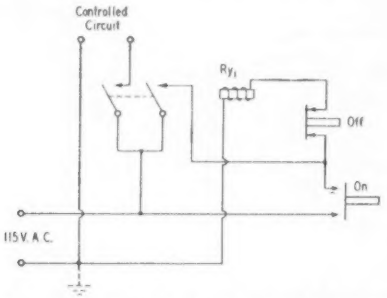


Fig. 1 — **The basic circuit of the electrical lock-in control system. Momentarily pushing the "On" switch will close Ry_1, and the relay will remain closed until the "Off" button is pushed.**

The operation of the basic circuit can be easily understood by referring to Fig. 1. A normally-open ("On") and a normally-closed ("Off") push button are wired in series with the hot lead to the relay coil. Then a set of light-duty contacts on the relay is wired across the normally-open button. Pushing the "On" button closes the circuit to the relay, energizing the relay and closing the contact that then shorts out the "On" button and holds the circuit to the relay. Additional contacts on the relay close the controlled circuits. Touching the "Off" button interrupts the current to the relay coil and the relay drops out. The holding contact opens and the relay will remain open until the "On" button is again depressed. By wiring protective interlocks and overload-relay contacts in series with the relay coil, instead of the power-transformer primaries, you can eliminate the need for heavy contacts and wiring in these circuits. Since only a momentary interruption is required to open the control relay, Ry_1, manual resets on overload relays are not necessary. Simple normally-closed relays can be used, and the reset will be automatic. Fig. 2 shows the basic circuit modified to include these protective devices and also remote push-button stations. Any number of remote stations may be used if all "On" buttons are in parallel and all "Off" buttons are in series. Operation of each station will be independent. The circuit can be closed at one station and opened from another if desired.

A practical controller using this circuit is shown in Fig. 3. It is designed to operate in a 115-volt line supplying three high-voltage supplies and one bias supply. Individual toggle switches are provided for each supply, with neon indicator lights for the filaments and each high-voltage circuit. A line-disconnect switch, S_1, is also provided. This switch must be capable of handling all the current drawn by the transmitter. If your supplier doesn't have what you want, try the nearest motor repair shop. The circuit provides time-delay protection for the high-voltage supplies, provision for safety door interlocks, overload protection for any number of circuits, a remote station for operation of the send/receive relay, a push-to-talk circuit, and an auxiliary terminal to supply voltage for operating an antenna change-over or receiver-silencing relay or both. The entire unit was mounted on a 3½-inch panel, with a 3-inch-deep sheet-metal channel serving as a dust cover and terminal mount. Surplus antenna relays were used for Ry_1 and Ry_2. These have two heavy contacts and one lighter one. The heavy contacts were connected as a single double-break contact and placed in the hot side of the a.c. line. The third contact was used as the holding contact. One relay energizes the filament and bias bus and the time-delay relay, while the second energizes the high-voltage bus. Pushing the "On" button will close Ry_1, which will lock in and supply current to the filament and bias terminals and the time-delay relay. Pressing the "Send" button will close Ry_2, which will lock in and supply current to the plate power supplies through their individual switches, S_4, S_5 and S_6. But Ry_2 will close only if all interlocks are closed and the time-

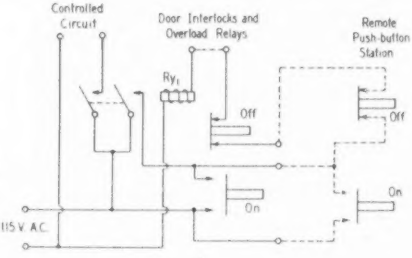


Fig. 2 — **The lock-in circuit is well suited for duplicate control push buttons and where interlocks and/or overload relays are used. In the basic circuit shown here, Ry_1 will close when either "On" button is pushed only if the circuit marked "Door Interlocks and Overload Relays" is already closed. The relay will open when either "Off" button is pushed or if the interlock/overload circuit is opened.**

* Willmar, Minn.

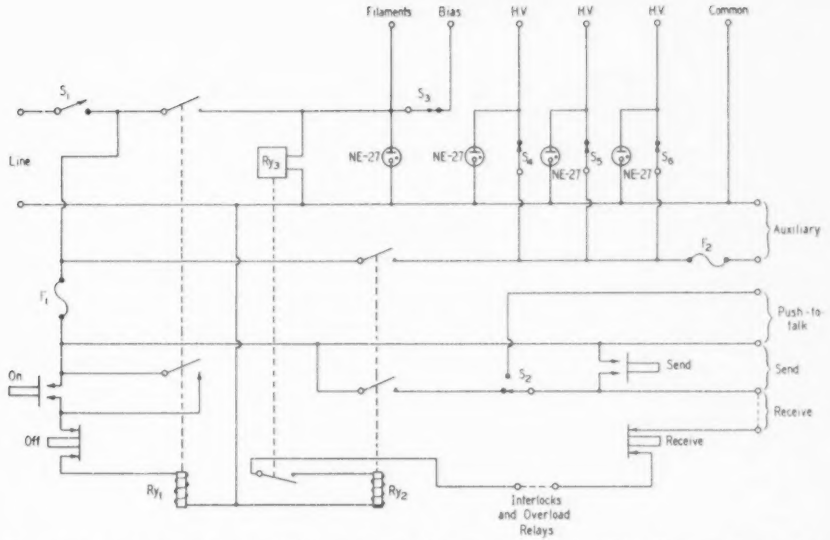


Fig. 3 — **A practical circuit for push-button control of a power supply furnishing filament, bias, and three plate voltages.**

F_1 — **Control-circuit fuse, 2 amp.**
F_2 — **Auxiliary-circuit fuse, depending upon demand.**
Ry_1, Ry_2 — **Surplus antenna relay. See text.**
Ry_3 — **Time-delay relay.**
S_1 — **Heavy-duty main power switch in ungrounded side of line, or d.p.s.t. in both sides of line.**
S_2 — **S.p.d.t. toggle, for normal or push-to-talk selection.**
S_3, S_4, S_5, S_6 — **S.p.s.t. power switch.**

delay contacts have closed. Operation of any overload relay or opening of any door interlock will drop the plate supplies from the line. Touching the "Receive" button will open the plate relay, and touching the "Off" button will remove the entire transmitter from the line. The "Off" button opens the plate relay by opening the time-delay contacts that are in the Ry_1 coil circuit. The time-delay relay must be a type that opens as soon as its voltage is removed. A straight thermal relay will hold its contacts closed so long as the element is hot and cannot be used.

The "Push-to-Talk" switch, S_2, disables the locking circuit on the plate relay and connects a line to a switch on the microphone. Ry_2 will now stay closed only when the "Send" button or switch on the microphone is held closed. With this form of operation, an overload will cause chattering of the relays until the push-to-talk switch is released. If this is considered a disadvantage, manual reset overloads may, of course, be used.

The circuit shown in Fig. 3 is presented merely as an example. Each station will probably require its own adaptation of the basic circuit. If no time-delay relay is desired, the locking lead for Ry_2 can be lifted from the junction of F_1 and the "On" button and returned to the "hot" filament and bias bus through another fuse. If 3-wire service is used, the control circuit shown would be placed in one 115-volt leg, with S_1 in the "hot" side. If a 2-wire line is used, a d.p.s.t. switch should be used at S_1, so that both sides of the line will be opened and there will be no need to observe the proper polarity.

One possible variation, which may appeal to a number of operators, would be to eliminate Ry_1 and its associated circuits and to substitute a large "Main Power" switch for the purpose. This switch might be one of the circuit-breaker type available on the surplus market. The push-button control would be used for the transmitter power supplies and the auxiliary circuits.

It should be obvious, of course, that the hold-in contact does not have to be on the heavy-duty relay but can be on a small relay. The coil of the small relay would be connected in parallel with that of the heavy-duty relay.

This control circuit has been in use here for three years now, and it has definitely proved its versatility. We would be lost without it. Give it a try — we think you will like it, too.

Strays

W1*RUM* is H. W. *COLLINS!*

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The July issue of *Senior Prom* (formerly *Calling All Girls*) carries an interesting article on amateur radio by Amelia Lobsenz, W2OLB, entitled "Come In, W2OLB." Amelia has also authored a new teen-age adventure book, *Kay Everett Calls CQ*, which is to be published soon. The book already is a Junior Literary Guild selection for older girls.

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

THOUGH it was a little slow in getting under way, the 1950 v.h.f. DX season has been without equal in past v.h.f. experience. After a disappointing month of May, 50-Mc. sporadic-*E* skip became a daily matter in June, and continued at full speed through July. When skip DX was lacking, there was aurora effect or tropospheric bending to keep the v.h.f. fraternity busy.

A heartening increase in 50-Mc. activity in many areas and widespread openings produced considerable interference on several occasions, as stations in all directions at distances of 300 to 1300 miles came in simultaneously. When double hop appeared, as it did frequently, permitting contacts up to 2500 miles or more, the resulting turmoil was something to behold.

On 144 Mc. there was nothing to match the extreme DX of June, when the 1200-mile record was set by W5VY and W8WXV, but frequent aurora periods provided the 2-meter gang with some fine chances to rack up new states. With the news getting around that aurora is not by any means the rare phenomenon on 144 Mc. that we once thought it to be, more of the gang are getting set for c.w. operation, and learning the signs that warn us of impending openings.

The picture can be drawn briefly by examining the 50-Mc. WAS box and the 2-meter standings, and comparing the records with those of a year or so ago. Every call area now has 50-Mc. men with at least 45 states worked, and with the exception of W6 and W7, where the reason lies in the size of the states involved, the 2-meter states totals run to two figures. Scores of 2-meter men now have DX of 500 miles or more to their credit, and at least 13 of those listed have equaled the figure that was the recognized record up to just a year ago.

Double-hop openings during July helped to boost the 50-Mc. totals, moving at least one more call into the listing at the head of the 50-Mc. WAS box. Nevada, represented by W7TJY at Gardnerville, was the big one as far as W9ZHL was concerned. On the night of July 26th, the 27-day recurrence of June's big session, these two got together, making 48 on 50 for W9ZHL. He is now holder of 50-Mc. WAS award Number 5. W7TJY also raised the temperatures of numerous East Coast operators this same evening, by being the first Nevada station to be heard in W1, 2 or 3 during a sporadic-*E* opening. Montana and Utah now remain the only holdouts, neither having ever been heard in the northeastern part of the country on 50 Mc., as far as is known.

*V.H.F. Editor, *QST*.

Fall V.H.F. Party — Sept. 23rd-24th

We've all been going strong this summer, and new recruits have come to the v.h.f. bands in considerable numbers. It is easy to hold their interest when things are hot, but if v.h.f. operation is to secure any permanent benefit from this influx these summer soldiers must be sold on year-round activity. The September V.H.F. Party has become something of an institution, already, because it gives the gang a shot in the arm just at the time that their interest might otherwise be tending to slacken.

The September Party is our chance to demonstrate the value of the v.h.f. bands for work under normal conditions. If openings of any sort come along that week end they can be regarded as dividends, but anyone who bears down during this contest is almost certain to have real fun if there is appreciable activity in his vicinity. If occupancy is low in your territory, this is your opportunity to get it started upward. Plan now to be on deck, and get everyone you know who has v.h.f. gear to do likewise.

The contest rules, appearing elsewhere in this issue, are as simple as ABC. Reporting forms are available on request, to simplify record keeping. Send for yours now — then use them, even if you work only one station. We want to know who is taking part, and how they are making out, even though there can be only one section winner.

Watch Out for Aurora

Many chances to work hard-to-get states and nice DX are going by the boards because not enough fellows are aware of aurora reflection. This phenomenon occurs more frequently than most of us have realized, and it is not necessarily confined to the spring and fall months. February through April and September through November are the major aurora periods, but all during the summer aurora has been showing up on both 50 and 144 Mc.

In some cases there was a woeful lack of v.h.f. activity. On July 11th, for instance, your conductor noted typical wavery short-skip signals on 28 Mc. at 5:45 P.M. On 50 Mc. a commercial harmonic coming from the south went fuzzy when the beam was aimed north (no amateur activity noted at that moment) so we went on to 144 Mc. Nothing was heard until about 7 P.M., when W8WXV was raised, for what was probably the first Ohio–Connecticut aurora QSO on 144 Mc. Then, for another hour the two of us called numerous CQs without result. W1–W8 QSOs could have been made by the dozen during that period, yet there was not another signal to be heard at either end!

Later that evening the aurora reappeared, and from about 11 P.M. on the few fellows who were in on it were having a field day. W2SFK, Glens Falls, N. Y., reports reception of W4AO, Falls Church, Va., W3BYF, Allentown, Pa., W8WXV, Shiloh, Ohio, W2RPO, Tonawanda, N. Y., W3QKI and W3NOJ, Erie, Pa., and W9677. These areas are seldom or never heard on ground wave from Glens Falls, indicating the possibilities open to the fellow who makes the most of aurora openings.

W8WXV, one of the most consistent aurora DX chasers on 144 Mc., says that extraordinarily good conditions for DX on 10 provide a tip-off. If he hears DX coming through unusually well, or later than usual at night, he checks the foreign broadcast stations in the 15–22 Mc. region. When a roar develops on them he loses no time in getting started on 144 Mc. Every time there is pronounced aurora effect on 28 Mc. there is something doing on 144, though too often it is only the unintelligible roar of 'phone stations, the operators of which are blissfully unaware that they are being heard at distances of 500 miles or more!

Two-meter signals reflected by the aurora are seldom strong. The best heard by W8WXV are no more than 25 db. above the noise, or S4 to 6, depending on your S-meter. Only a few run more than 5 to 6 db. over the noise, and the

character of the signal makes it seem even weaker. Aurora signals are best described as a "whisper superimposed on a rush" so they are not always easy copy. Those of us who are a little weak on c.w. operation need not worry on this score, however; the nature of aurora work requires slow sending, and most of the v.h.f. gang are no hotshots with a key, so the chances are that slow code speed will be no handicap in this work.

Aurora seems to develop most frequently in the late afternoon hours, lasting until early evening. There may be a fadeout then, with a reopening again around 10 or 11 P.M. Sometimes openings develop quickly and fade out in a matter of minutes; other more pronounced disturbances may run for several hours at a stretch, recurring over a period of two or three consecutive days or nights.

Most ionospheric disturbances are predictable in advance, and the latest information on anticipated ionosphere storms is transmitted nightly by ARRL over the Headquarters Station, W1AW, during the regular bulletin periods. Sent on both 'phone and c.w., on all bands from 2 to 160, these warnings are effective as much as three weeks in advance, and are corrected whenever short-notice warnings are available.

There was aurora again early in the evening of July 24th. W8WXV was heard in QSO with W1IZY around 8 P.M. Then the writer raised W2BEV/8, Lockwood, Ohio, followed by W8RWW, Detroit, Mich. The latter is believed to be the first Michigan-to-W1 QSO on 144 Mc. W3KWL, Farrell, Pa., was heard S5. Again, there were several strong 'phone carriers, but none of them was intelligible, or even close to it. W8RWW reports hearing W1IZY and W1OOP, both over 600 miles, W2SFK, W3s RUE and KWL, W8s WXV and WRN, and W9s HXU, EHX, and UCH.

Don't forget that aurora is great stuff for the 50-Mc. man, too, with a coverage of 100 to 700 miles or so providing an unequaled opportunity for working those close-in states, so hard to collect by any other medium. And remember that appearance of aurora may be a tip-off on a chance to work South Americans on 50 Mc. the following morning. The fall DX season is just coming up — who will be the first to work into South America this fall?

Here and There on the V.H.F. Bands

Bolt Tail, South Devonshire, England — A new European 145-Mc. record was set on June 28th, when G5BY worked DL3FM, Muelheim, Germany, a distance of 470 miles. A series of contacts starting at 2100 GCT included ON4IF and ON4HN, Antwerp, 370 miles, DL3FM, and F8JR and F3LQ, both of Lille, France, 310 miles.

Grenada, B.W.I. — We may yet have that long-sought 50-Mc. activity in the West Indies. VP2GG sends word that he is revamping a DM-36 for 50 Mc., and working on a 50-Mc. beam. He promises to be on before the September V.H.F. Party.

Another prospect is PJ5RP, Aruba. Harry would like very much to try 50 Mc., but available equipment gives little promise of doing a job on that band. He would like very much to borrow (with a view to buying, should 50-Mc. work be possible) any W ham's spare 50-Mc. gear. Any interested party get in touch with Harry Dudart, Aruba Trading Company, Aruba, N. W. I.

Toronto, Ontario — An impromptu gathering of the v.h.f. fraternity of the Toronto area, for the purpose of entertaining visitors Bill and Helen McNatt, of *The V.H.F. News*, also served as an opportunity for getting an informal v.h.f. organization underway. To be known as the Southern Ontario V.H.F. Group, the v.h.f. operators around Toronto plan a series of meetings of an informal nature. The first will be held on Sept. 15th at 8:30 P.M., at VE3AGW's Riverside Lodge, Oakville, Ont. All amateurs active on 50 Mc. and up are invited. For further details, see VE3s EAH, DAN, AIB, AGW, or ANY.

Ashland, Ohio — In receiving aurora signals on 50 Mc. recently, W8NQD discovered, quite by accident, that the readability of some voice signals distorted by the aurora effect is improved if the b.f.o. is left on and tuned carefully to zero beat. Has anyone else tried this?

Olmitz, Kan. — V.h.f. activity in Central Kansas has, in the past, been largely a matter of getting set up for business and then waiting for band openings to some other part of the country before any contacts could be made. Now, however, with the improved equipment in use and the greater activity around the state, WØIPI is finding both 50 and 144 Mc. fine when they are not open. On 2 meters WØZKF, Wichita, 105 miles, can be worked with good signals. WØDSR, 135 miles away in Greenleaf, is worked on occasion, and WØJFE, Abilene, and WØPKD, Salina, are worked easily. On 50 Mc. WØs PKD, MVG, and QDH are always good. Several good contacts have been made with UQM, 110 miles to the west, and BPL, Fredonia, 190 miles, comes through well when ground-wave conditions are favorable.

Los Angeles, Cal. — In order to promote regular v.h.f. activity by providing a continuing incentive, Tom Wing, W6MVK, is sponsoring three v.h.f. contests, beginning Sept. 1st. One is a marathon affair, with a large trophy to be presented to the operator who works the greatest number of miles on 144 Mc. and higher bands during the contest period, Sept. 1st through Dec. 31st. The competition is for fixed stations only, and other fixed stations may be worked only once during the contest period. Portable or mobile stations may be worked more than once, provided that a different location is used by the portable or mobile each time. They may be counted no more often than once per 24-hour period. Score is computed by adding the airline mileage of each contact, applying a multiplier of 5 for contacts on 220 Mc. and higher bands.

The second is an activity award, with smaller trophies to be awarded to the operator in each ARRL section in California making the greatest number of contacts in the contest period. The same station can be worked once each month during the contest period. The multiplier of 5 applies to contacts on 220 and higher. Both these contests are for single-operator fixed stations only.

The third is for portable or "expedition" stations. An award similar to the section award, above, will go to the operator or group of operators of the portable station making the longest distance contact with a fixed station during the contest period. No multiplier applies.

The contests will be run again, concurrently, every four months, with a 3-time winner keeping the award permanently. Decisions by the Board of the Two Meters and

2-Meter Standings

	Call States	Areas	Miles		Call States	Areas	Miles
W1HDQ	14	5	530	W5JTI	13	5	660
W1PIV	13	5	550	W5ERD	8	3	570
W1BCN	12	4	500	W5ML	8	3	560
W1CTW	12	4	500	W5VY	7	3	1200
W1REZ	11	4	—	W5JLY	2	1	1000*
W1JSM	10	3	—				
W1GJO	10	3	—	W6ZEM/6	1	1	415
				W6DLR	1	1	190
W2BAV	14	5	430				
W2NLY	13	5	515	W7OWZ	3	2	100
W2NGA	13	5	—	W7MVK	2	2	100
W2DFV	13	5	350				
W2CET	12	5	405	W8WJC	19	7	700
W2DPB	12	5	500	W8UKS	18	7	720
W2WLS	12	4	—	W8WXV	16	8	1200
W2QNZ	11	5	—	W8BFQ	16	6	600
W2NPJ	11	5	500	W8WSE	14	6	620
W2FHJ	11	4	—	W8RWW	13	7	600
W2PJA	10	4	—	W8WRN	13	5	500
				W8CYE	12	6	—
W3RUE	16	7	760	W8CPA	12	—	650
W3KBA	13	6	—				
W3OWW	13	6	600	W9FVJ	15	6	600
W3GKP	13	6	610	W9JMS	13	6	600
W3KUX	12	5	575	W9PK	10	5	—
W3PGV	12	5	—	W9GLY	10	5	525
W3NKM	12	5	—	W9UIA	8	6	490
W3KWH	11	6	—	W9NFK	8	4	410
W3KWL	10	5	—	W9OBW	8	4	—
W1HHK	13	5	650	WØNFM	14	7	660
W1IKZ	13	5	500	WØEMS	13	5	830
W1CLY	12	5	500	WØWGZ	10	4	700
W1FJ	12	5	450				
W1FBJ	11	5	—	VE1QY	9	3	650
W1JDN	11	5	—	VE3AIB	8	5	520
W1MKJ	10	5	475	VE3BPB	6	4	—
W1JFV	9	5	830	VE3BQN	5	4	510

* Crossband.

Down Club of Los Angeles to be accepted as final. Mileage to be based on Geological Survey maps of California. Contestants limited to stations within the borders of California.

Cochituate, Mass. — Reading in these pages of W1DJ's 950 QSOs on 50 Mc. in 1950, through May, W1SNK sends along his 2-meter record. In the first six months of 1950, Dick made 1351 contacts on 144 Mc.!

Toledo, Ill. — W9FVJ has had his share of DX on 144 Mc. as evidenced by his long hold on the top spot in the 2-meter standings among the W9s. His contacts with W5ERD and W5ML were probably the first with Texas and Louisiana to be made by an Illinois station. But an accomplishment in which he takes at least as much pride is the maintenance of a Sunday morning schedule with W8CYE, Miamisburg, Ohio. Work over this 210-mile path has been going on successfully, almost without a break, for the past 18 months.

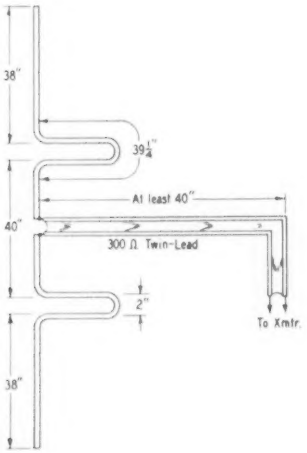
Tulsa, Okla. — Don't always judge the effectiveness of a 2-meter array by counting the elements. W5DFU took the 16 directors off his 48-element array and netted an improvement in performance. This bears out your conductor's experience with large phased arrays. More elements contribute only if they help to sharpen the pattern of an array. A large number of driven elements, with reflectors, will have a sharp pattern already, leaving very little to be done by adding a set of directors.

Warren reports 2-meter activity throughout Oklahoma, with W5s LGW at Drumright, HXK, Watonga, HTZ, Cromwell, IOW, Ada, HLD, Oklahoma City, and CFN, Hobart, on almost daily, after 6:30 A.M. and 9 P.M.

Willard, Wis. — Wondering what the reliable range on 144 Mc. would be from your location? You never know until you try — it may surprise you. For some time now W9FPE has been keeping regular schedules with W9TKL, Waukegan, Ill., some 200 miles to the southeast, and WØJHS, Champlin, Minn., about 140 miles to the west. During June contact was made with W9TKL 21 days out of 28 tries. WØJHS or WØHXY were logged 22 days in the same period. These daily tests soon disclosed that other stations farther away were hearing W9FPE. W9ZHB was added to the daily schedule, when it was found that the two were hearing each other quite regularly, and this 240-mile path was covered 13 times in 21 tries. W9EHX, McLean, 380 miles, showed up when conditions were at peak.

For Vertical Areas Only

A rotatable antenna can be a nuisance, especially during a v.h.f. contest, when it is often necessary to swing a sharp beam around again and again, just to work stations within a radius of 25 miles or so. And, if the truth were known, about all some vertical beams contribute (?) to 2-meter operation is sharpness of pattern. There are many 3- and 4-element vertical arrays that are not much better, in their best direction, than a good dipole is in all directions.



Stacking a few dipoles vertically can bring about a noticeable gain, as a result of lowered radiation angle, without introducing horizontal directivity. While there is nothing new in the idea, we feel that 2-meter operators in the vertical-polarization areas could make good use of the vertically-stacked system shown in the adjacent sketch. The dimensions are those used by W2GYV, Schenectady, N. Y., who has been using this type of antenna for some time with good results. It will not match the performance of large phased arrays, of course, but it has its uses, particularly in v.h.f. contests, net operations, and general local operating. Freed of the need for rotating mechanisms, the average ham can put up such an antenna higher than he might place a rotary array, and height is often an important factor in extending the local range.

The system can be made and supported in a number of ways. W2GYV makes his solid enough so that it can be supported at the cold ends of the phasing sections. These low-voltage points can be fastened to the supporting pole without insulation, and may be grounded for lightning protection. A triple stack can be fed at the middle of the center section with 300-ohm line without serious mismatch.

A somewhat similar arrangement is in use on 220 Mc. at W1CTW, Arlington, Mass. Cal reports that installation of his stacked-dipole system in a high outside spot resulted in as good coverage in all directions as he had formerly had with an 8-element double Yagi indoor beam that had to be rotated for nearly every contact.

(*Continued on page 100*)

50 WAS Mc.

Standings as of July 27th

WØZJB	**48**	W5VY	47	W8CMS	40
WØBJV	**48**	W5JTI	44	W8LBH	37
WØCJS	**48**	W5ML	44	W8WSE	36
W5AJG	**48**	W5JLY	43	W8RFW	35
W9ZHL	**48**	W5ONS	43		
W9ZHB	48	W5VV	42		
W9QUV	48	W5FSC	41	W9HGE	47
W6WNN	48	W5GNQ	41	W9PK	47
		W5JME	41	W9ALU	46
W1CLS	46	W5NHD	41	W9NJT	46
W1HDQ	46	W5HLD	40	W9JMS	45
W1CGY	44	W5HEZ	35	W9QKM	45
W1LLL	44			W9RQM	45
W1KHL	43	W6UXN	47	W9UIA	45
W1HMS	43	W6OB	46	W9UNS	42
W1LSN	41	W6OVK	40		
W1EIO	40	W6TMI	40	WØQIN	47
W1GJO	38	W6IWS	40	WØDZM	47
W1RO	36			WØNFM	47
W1ELP	36	W7HEA	47	WØINI	47
W1DJ	36	W7ERA	47	WØKYF	44
		W7BQX	45	WØJOL	44
W2RLV	45	W7DYD	45	WØJHS	43
W2BYM	42	W7JRG	40	WØPKD	43
W2AMJ	41	W7BOC	40	WØTKX	43
W2IDZ	40	W7JPA	40	WØHVW	42
W2GYV	40	W7FIV	40	WØIPI	41
W2QVH	38	W7CAM	40		
W2FHJ	37	W7KFM	40	VE3ANY	38
		W7ACD	35	VE1QZ	32
W3OJU	45			VE3AET	29
W3NKM	39	W8QYD	45	VE1QY	28
W3JVI	37	W8YLS	41	HC2OT	26
		W8NQD	41	XE1GE	19
W4FBH	45				
W4EQM	44				
W4QN	43				
W4FWH	42				
W4CPZ	39				
W4MS	38				
W4OXC	37				
W4BEN	35				

Calls in **bold face** are holders of special 50-Mc. WAS certificates, listed in order of the award numbers. Others are based on unverified reports. If you have 35 or more states worked on 50 Mc. send in a list for inclusion in this section.

I.A.R.U. News

CONGRESS HIGHLIGHTS

A twenty-fifth anniversary Congress of the International Amateur Radio Union was held in Paris on May 18th–20th, under the sponsorship of the *Reseau des Emetteurs Français*, with nearly 100 delegates representing some 15 member-societies. W. A. Scarr, G2WS, president of the R.S.G.B., was elected president of the Congress, following welcoming speeches by M. Georges Barba, F8LA, president of R.E.F., Prince Louis de Brogolie, secretary of the *Academie des Sciences* and president of honor of the Congress, and Gen. Gilson, chief signal officer of the French army.

Agreeing that band planning as a principle should be accepted, the Administrative Committee, under the chairmanship of S. K. Lewer, G6LJ, made recommendations based on the R.S.G.B. plan which calls for subdividing the principal amateur bands as between 'phone and c.w. use.[1] After considerable discussion, the committee rejected the A.R.R.L. suggestion, conveyed by letter, that representation at international conferences be at the national level, choosing instead to recommend that participation should be on an international basis through I.A.R.U. since many societies do not enjoy the close contact with their government regulatory agency that A.R.R.L. does. A proposal to move I.A.R.U. Headquarters to a European society was discussed at length and resulted in the committee recommending that A.R.R.L. be continued as the headquarters society but that a bureau should be established to represent the interests of members in Region I (Europe, Africa, part of U.S.S.R.); R.S.G.B. was invited to accept the responsibility for such a bureau. Member-societies, finding themselves agreed that the number of international amateur contests should be reduced, were requested to submit their plans for eliminating and combining contests to the Region I bureau so that a coördinated plan could be evolved and put into operation sometime in 1952.

Technical Committee meetings, under the chairmanship of Lt. Col. P. Revirieux, F8OL, discussed improvement in the use of the crowded amateur bands, reduction of interference to television and aural broadcasting, and collection and correlation of propagation data. Concerning voice operation, the committee recommended that audio equipment provide attenuation at 4000 cycles of at least 26 db. with reference to the response at 1000 cycles, and that there be no measurable energy radiated more than 10 kc. from the carrier center; maximum deviation for n.f.m. was recommended as 2.5 kc.

[1]See p. 40, Sept., 1949, *QST*.

NEW ZEALAND

The 1950 VK/ZL International DX Contest sponsored by the N.Z.A.R.T. and the W.I.A. will be held in two sections: September 22nd–24th and October 6th–8th for c.w., Sept. 29th–Oct. 1st and Oct. 13th–15th for 'phone. Starting and ending times for all the dates are 1201 GCT and 1159 GCT, respectively. Open to any amateur station in the world, participants may use any assigned amateur band. Only one contact per band per week end with any one station is permitted and separate 'phone and c.w. logs must be submitted by stations entering both sections. Operators at multiple-operator stations must each submit separate logs.

Serial numbers must be exchanged and acknowledged. The serial number of 5 or 6 figures will be made up of the RS or RST reports plus three figures which may begin with any number between 001 and 100 for the first contact and which will increase in value by one for each succeeding contact. Fifteen points will be scored for the first contact on a specific band with any VK/ZL district, fourteen points for the second contact with the same district, and so on to the fifteenth contact with that district which will score one point. Each successive contact with the same district will then score one additional point. This scoring procedure will be repeated on each band used.

Logs must show in this order: date, time in GCT, band, call of station contacted, number sent, number received, points. Separate logs must be submitted for each band. An analysis sheet by bands of districts contacted and points garnered plus the usual summary sheet and declaration of adherence to rules must be attached. Send logs to N.Z.A.R.T., Box 489, Wellington, N. Z., marking the envelope VK/ZL Test, so that they reach there no later than January 14, 1951.

FRANCE

In order to encourage communication with countries of the French Union, R.E.F. has established a new certificate, the DUF. The certificate will be composed of four parts, each based on a certain number of contacts with French Union countries in the different continents. QSL cards will be submitted to the member-society of the I.A.R.U.; these will be checked and the applicant's eligibility for the award certified to the R.E.F., which will thereupon issue the certificate. A.R.R.L. Headquarters will supply details on this new award upon request.

(*Continued on page 102*)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

The annual 28-Mc. DX boom season is close at hand. The kilocycles in this portion of the amateur spectrum take such a mauling during W/VE cooler months that perhaps it is for the best they are allowed to recuperate over midyear.

Despite the possibility that the band will not be quite as hot as during previous seasons we expect to witness the completion of many DXCCs thereon. In this connection much mail begs us to point out a thing or two for the attention of operators at DX locations who intend to give Old Ten another go.

As we all know, the 28-Mc. range is fairly extensive compared to our lower frequency assignments and the number of Ws active and listening for DX on the band reaches a mountainous peak. Indeed, so great is activity that even a short 'phone CQ or QRZ by a DX station is likely to be answered by dozens of plaintive calls from below 28,500 all the way up to and past 29,000 kilocycles *when the DX operator fails to indicate his tuning procedure*. The resultant din can and does knock out many otherwise perfectly solid QSOs.

Operators of DX stations who make a habit of specifying a limited range of frequencies to be immediately scanned by their receivers ("I shall tune approximately 28,650 kilocycles," etc.) prevent such chaos. Many do use this technique and report effective results.

DX operators out for rare DX themselves and having no intention of tuning the U. S. 'phone subband should state so. While such an announcement may nettle a few ulcer-bent W boys, the majority will appreciate the courtesy of saving them wasted time and vocal energy.

And, say, Forty and Eighty are due to start stepping out again. As many foreign amateurs are restricted by regulation to the proximity of the lower band edges it would be kind of fellows not interested in working this DX to help out with an upward QSY when the bands are in an open mood. Your DX-happy brethren will thank you a meg.

What:

The roaming DX Spotlight, formed by great numbers of varitype beams, seems to have centered upon St. Pierre Island during the past month or so. FP8AC (W6SAI) was supplanted by FP8AF (W3BVN) according to KV4AA. Those of us with this new country on our check-off lists can only toss an accolade in the direction of the pioneering and enterprising spirit of the gang who made it possible . . . . KZ5IP is making a last spurt for the juicy ones before returning to **W8BQV** and hasn't exactly been talking to himself: **FF8JC** (14,019), **FK8AL** (14,055), **FY7YB** (14,021), **EA9AQ** (14,039), **CR4AF** (14,025 t7), **CR6AQ** (14,063), **GD3FAC** (14,032), **DU1CE** (14,057), **DU1DO** (14,056), **HH5VE** (14,005 t7), **HZ1AB** (14,007), **KC6WC** (14,061 t8), **PKs 1LK** (14,061), **3TT** (14,051 t9c), **4KS** (14,058), **6NL** (14,010), **VP5BF** (14,040), **VP7NU** (14,116), **VRs 1A** (14,060), **1C** (14,118–140), **VS6BO** (14,046), **SPs 1CM** (14,004), **5ZPZ** (14,055), **YUs 1CBF** (14,001), **3FMA** (14,019), **3FLE** (14,063), **UD6AH** (14,110), and **ZM6AK** (14,050 t9c). This with an 807 and dipole plus a 75-A receiver. . . . . W9ABA caught up with new ones **AP2N** (14,145), **UAØFR** on Sakhaline Island (14,250), **VQ4AO** (14,100) and others while awaiting slow pasteboards from CR5UP, HZ1KE, UQ2AB, and ZD1PW . . . . . The new vertical at **W9NN** secured much nice DX in preliminary tryouts, with MI3IM the main attraction. . . . . W8DAW is intrigued by an **HV1A** (14,007 t9c) whom he persuaded to take time out from local European contacts. This would be No. 161 for Russ but we must bear in mind I1PL's remarks in "Tidbits." . . . . . **VKs 1PG** (14,090), **9MR** (14,090), **9WL** (14,125), **VQs 3KIF** (14,080), 4KIF, **ZC6PR** (14,120), **ZE3JJ** (14,075), and **FQ8AA** (14,100) kept W8ZZU quite satisfied and Stan still pursues the elusive **VQ8CB** (14,105–120) of the Chagos . . . . . W6ZBY finds break-in operation a boon to DX operation if merely for the purpose of saving unnecessary calling with its attendant QRM. The new ground-plane contraption helped Jack to **PKs 4VD** (14,100), **5CC** (14,100), **5RU** (14,086), **C3WW** (14,054), VP7NM, and **VK1YG** (14,130). C3WW speaks of Mary and Ping as YL operators of C3CL . . . . . VP5AX, C3DD, DU1VVS, HP2RO, KB6AJ, and KJ6AF QSLs are awaited by W6GPB and Joe recently added VP1AA, **YU1CAG** (14,001), HA5BF, PK3JT and the unstable 8-watter of AC4RN . . . . . W2WL added **FM7WF** (14,040) after quite a battle and KG6DI can't figure out the XE2MK near 14,100 who gave his QTH as near Nanking plus a Japanese QSL address . . . . . W7AH, whom you'll remember as Jeeves' former boss, W1CH, reports Arizona conditions as being the nuts. When not wound up in a.m. and TV work in the sunny state, Joe adds to his DX total of 132 countries with 87 confirmed . . . . . After straying to six meters for a time, W5FXN had a visit from W6ANN that hopped him up for another go at twenty. **TA3FAS** (14,078), **WØBFE/KJ6** (14,123), **I1BCB/Trieste** (14,020), **OA8A** (14,085), **VQ2AB** (14,120), **DUØIV** (14,100) and an FF8 were snared . . . . . W4OEL has been off the air for a few months but tried the receiver on **FB8ZZ** (14,050), **FY8AC** (14,010),

M/Sgt. Jim Fry, TA3FAS, has been an all-band mainstay for some time. During the past year Jim has sent out an even 2000 cards, has received only 252 in return. Does he have yours?

* DX Editor, *QST*. Please mail reports of DX activity to W9BRD's home QTH: 1517 Fargo Ave., Chicago 26, Ill.

OY3IGO (14,020), **MD7XP** (14,012), **CR4AE** (14,004), **KB6AM** (14,152), **VR2BT** (14,058), **FY7YB** (14,053) and several PKs and YUs . . . . . W5ONL supplied KG6FAA, KX6BA, FK8AB, KG6CX/KX6, HC2KB, and FA8BG with Arkansas QSOs and W9BQE ran into **ZE3JO** (14,050–100) who is ex-G2SO . . . . . **F9QV/FC** continues to push a creditable signal through around 14,040 kc. and **TA3AA** holds his own on 14,000 . . . . . At W2TXB we have some choice numbers in **SV1TW** (14,020), **MS4FM** (14,050), UO5KAA, and VK9MR. SV1TW represents Crete, by the way, and SVØWY vouches for his authenticity . . . . . The latest Spitzbergen attraction, **LA9JB** (14,050 t3e), is receiving much attention at this writing. . . . . *The DXer* of the No. Calif. DX Club adds the following as currently active: **VR4AA** (14,100), **ZK2AA** (14,110), **FK8AI** (14,083), **PK6VK** (14,115), and **XU1NK** (14,020). That last one sounds like old times, eh?

This same organ indicates some elegant 'phone items: **HR1PA** (14,260), **VK9RB** (14,341), **XZ2s KN** (14,318), **SY** (14,342), **FF8MM** (14,285), **YN4NW** (14,247), and **CP5EA** (14,300) . . . . . As usual, XE1AC skims plenty of cream off the A3 milk supply. Al swapped yodels with **PK4DA** (14,195), **PJ5RX** (14,337), **PK7HR** (14,186), **EA8AW** (14,305), **EA9AI** (14,314), **IS1BV** (14,317), **SP5AB** (14,121), **VR2BJ** (14,206), **KJ6AJ** (14,225), **KW6AP** (14,224), **ZC6DH** (14,348), **GC2RS** (14,189), **HL1US** (14,284), **FA3ZH** (14,334) and **3V8BB** (14,398) . . . . . W2TXB's voice successes include **VR3C** (14,168–380), **ZK2AA** (14,305), **UA4RJ** (14,175) and KC6WC while W6GPB adds JAØIJ of Iwo Jima . . . . . W7KSA captured **VQ8CB** (14,321) and adds TA3GVU, LX1DC, ZC6JM, HS1SS, VU2ET, OE13AA, FO5AD, VR1C, EK1MD, CN8EE, ZM6AA, PK1BR and one EP8EE, all mostly inhabiting the high end of 20.

An interesting note arrives from KV4AA anent *one-sixty*. Among other rare DX stations intending to give our l.f. band a try this season is friend TA3FAS. Jim is all set for the QRN to lift so that he may be instrumental in completing W 160-meter WACs. We won't be completely surprised to see it done this season, either.

FPSAC enabled W4BRB to check off his 81st *eighty*-meter country and Gene is all set to collect the remaining 19 when OM QRN eases up . . . . . W2USH was startled when **G8JR** (3506) came back to him in mid-July.

As for *forty*, W3DGM has been exploring the third layer to the tune of ZB2I, VQ2GW, and ZD4AB, all near the low edge . . . . . 7-Mc. conditions haven't been too groovy down under but **VK5XK** tells W3DLI he's still passing out Kangaroo Island QSOs on 7033 kc. with his 6L6 . . . . . W4MCM wasn't behind the door when **SVØWH** (7009), **VP5BF** (7013), **KS4AC** (7020), **ZL1BY** (7023), **FA8RJ** (7025), and **HK4DP** (7042) were passed out . . . . . The 459A of W7MKW came to the attention of **FK8AI** (7020), ZK1AZ mobile-marine in the Cooks, VR2AA, and **LU7ZA** (7050) of the South Orkneys . . . . . Taking time out from his WAS hunting, W7LFL snapped up KJ6AJ, **JA2DD** (7015), JA2CT, UAØFJ, LUs 1EP, 7AZ, and the aforementioned HK4DP and ZK1AZ.

Ten had succumbed to an epidemic of short skip just prior to this writing, sounding much more like 75 in the dead of winter. But W2ZVS managed to work CR4AC, VQ2VR, EA4DA, ZE2KH, ZD4AH, and many South Americans during the screwy spell. **CR4AC** hangs out on about 28,270 . . . . . *The DXer* specifies **FD3RD** (28,300) and **PJ5FN** (28,300) as good bets. And that about winds up our kilocycle ride for this month.

Where:

Although the address of the headquarters of The Radio Society of East Africa has changed to P. O. Box 5681, Nairobi, Kenya Colony, the RSEA QSL Bureau remains as before, P. O. Box 1313 of the same city . . . . . The *Asociación de Radio-Aficionados de Oriente* announces a QSL bureau to handle cards bound for CM8 COS stations at P. O. Box 666, Santiago de Cuba . . . . . "The I.A.R.U. News" section of this *QST*, page 102, includes corrections and additions to the list of world QSL bureaus.

C3CL	P. O. Box 1, Taipeh, Taiwan, China
CN8EX	Navy 214, Box H, FPO, New York, N. Y.
CS3AA	APO 406, % PM, New York, N. Y.
CX4CV	Box 37, Montevideo, Uruguay
DL6DQ	W. Kaschmann, Trier, River Mosel, Nagerstrasse 12, French Zone, Germany
EA4DA	Box 220, Madrid, Spain
EA6EG	Juan L. Gomila, Ave. Antonio Maura 13, Box 14, Palma Mallorca, Spain
FK8AI	Airport, Tontouta, New Caledonia
FY7YC	Ravin, % Post Office, Cayenne, French Guiana
ex-HC1KE	A. F. Janowitz, % Wiesen Rd, No. 1, Bedford, N. Y.
HP1FI	L. Cecil Fidanque, P. O. Box 721, Panama, Republic of Panama
HP1TP/HP2	Box 2195, Cristobal, Canal Zone
HS1AS	% Signal Corps, Bangkok, Thailand
HZ1AU	(via ARRL)
KG6CX/KX6	Navy 824, FPO, San Francisco, Calif.
KL7AFA	Box 448, 375th Recon. Sqdn., APO 937, % PM, Seattle, Wash.
KX6AA	Unit 82, Navy 824, FPO, San Francisco, Calif.
MD9AA	(via RSGB)
MI3IM	APO 843, % PM, New York, N. Y.
ON4EE	E. Eliard, 73 Rue Elise, Brussels, Belgium
PK1BR	P. van de Rivière, 135 Dagoway, Bandoeng, Java

PK4VD	Medan, Sumatra
PK5CC	% Garuda, Indonesian Airways, Bandjermasin, South Borneo
PK5JT	% Garuda, Indonesian Airways, Bandjermasin, South Borneo
PK5RU	Box 21, Bandjermasin, South Borneo
PK6LN	Box 76, Macassar, Celebes
PK6NI	Post Office, Biak Island, Netherlands, New Guinea
VP6JL	Box 148, Bridgetown, Barbados, B. W. I.
VQ2VR	40 Geddes St., Nkana, Northern Rhodesia
VR2BZ	J. B. Hogg, Laucala Bay, Fiji Islands
VS6AG	J. J. Alvarez, 3 Minden Ave., Kowloon, Hong Kong
YU1CAG	P. O. Box 180, Ljubljana, Yugoslavia
ZE2KY	W. O. Brett, RAF, Kumala, North Bulawayo, Southern Rhodesia
ZK1AZ	Thor Gunderson, Raratonga, Cook Islands
ZM6AK	Box 177, Apia, British Samoa
3A1A	(to DL4ND)
4X4AF	E. Biegon, 38 Jacotinsky St., Tel-Aviv, Israel
4X4AG	A. Kashiff, P. O. Box 4099, Tel-Aviv, Israel
4X4AL	E. Livny, 115 Ayarkon St., Tel-Aviv, Israel

Our QTH sleuths this month include W1s ODW JCT, W2s CJX DKF ZVS, W3JTC, W4s LYV NUI OEL, W5s FFW FXN ONL, W6s EAY ETJ GPB ZBY, W7s KSA LFL MKW, W8s QC ZZU, W9s ABA CFT IVN KOK NN, WØVIP, KZ5IP, and the No. Calif. DX Club's *DXer*.

Tidbits:

KV4AA intrigues us with word that a group of PY fellers intend to operate some ham radio on Trinidad Island during September. This isn't the VP4 job; Brazil's Trinidad is roughly about 500 miles east of the mainland near the juncture of the 30°W and 20°S parallels, a rugged deal like Ascension or St. Helena . . . . . There will be a flurry of amateur activity in Spanish Guinea ere long according to XE1AC. This will most probably be of the A3 denomination so we had all better brush up on our Español . . . . . The whereabouts of former YK1VL and JA2AZ is sought by W2QHH. Howy recently added the Maritime Mobile (30 QSLs) and WAA certificates to his wallpaper collection and notes that CS3 now appears to be an additional Azores prefix . . . . . 4X4CJ is interested in forming a world-wide QRP club and desires to hear from parties with allied ideas. Write Bob Avigor, 4 Nachlat-Benjamin St., Tel-Aviv, Israel, in this regard . . . . . We hope there is some error somewhere in the tale that, for some reason, PKs 4DA, 5HL, and 6CS have had their equipment confiscated and are thus QRT . . . . . W9ABA reports that W6WKU has returned to W9 after rolling up 175 countries out west. Buzz was glad to work the new legitimate VR1C after having been fooled by a phoney one during mid-'49 . . . . . HP2RB informs us that he is just now becoming familiar with c.w. and thanks all the DX crew for their patience and QRS . . . . . W8ZZU hears that OX3BR is shoving off for home and G2MI tells W2AGW that RAF ham activity in Iraq (YI) has been resumed . . . . . The power station on St. Pierre must be on the ropes by now. Bill Orr, W6SAI, was to have been relieved at FP8AC by Lyt Ballard, W3BVN, signing FP8AF. Some day Jeeves' catastrophic prophecy may come true. He envisions a frightful day when all W/VE hams get the same DX-excursion idea at once, all take boats to Cocos-Keeling in the Indian Ocean, and all set up gear, leaving nobody at home to QSO . . . . . Unless the semi-undercover MD9AA turns out to emanate from Yemen or some equally exotic neck-of-the-woods, W2AGW, W3JTC and others will be disappointed. At this writing we dunno, either . . . . . With 210 confirmed, W3JTC takes time out to give us some pitch on DL4ND's first session in Monaco as 3A1A. Ford put in about six hours and contacted 48 stations among which were W2s BXA, MYY, PEO, W3s GHD, GRF, W4NNN, W8HGW, and WØYXO. W3JTC made the grade, himself, and says that Ford had intended to linger a week or longer in 3A1, cutting his stay short because of circumstances beyond his control. DL4ND wonders why some F station doesn't indulge in Monaco operation inasmuch as the city of Nice is but a mere seven miles away . . . . . Despite rumors to the contrary, I1PL maintains there has been no legit HV (Vatican State) operation since the war. Chas and I1HR tried vigorously to obtain permission for Vatican operation but after months of negotiating the results were negative. "I plan to rebuild my rig in 1950 style; the future XYL does not like these haywires," writes I1PL. Yea verily, women are the same all over! . . . . . W2ZYX of the Coast Guard is glad to see that his buddies made hay in getting VR1C on the air. Johnny writes that KH6LX and WØCTV (now W6SVY and W2AIG) were at Bakati Atoll in early 1948 but found the amateur radio possibilities fraught with red tape. W2ZYX has held the calls KG6DK, KH6KU, and W1JCT . . . . . Further re VR1C, WØVIP learns that one of the operators hails from Story City, Iowa, and has been seeking 'phone or c.w. schedules with stations in that vicinity . . . . . W6DTY wonders if some of the 14-Mc. r.a.c. doings to which we have referred periodically are not due to TV-set radiation. Receivers of particularly poor design and/or construction can radiate wobbly rough harmonics from the horizontal oscillator circuits well up into the h.f. range. These may be identified as such by checking their spacing (15.75 kc.) . . . . . We learn through Gerald R. Andrew, an associate of W1NLM, that the newly instituted *Braille Technical Press* for the blind will include an amateur DX column. We shall be proud to help out by submitting advance copy from this corner . . . . . W3DLI sends us a sample segment of the No. 40 antenna wire used by VK5XK of Kangaroo Island. The latter works Ws on 80 with the stuff. Hams who are QRT because of neighborhood skywire prohibitions may be missing a bet by not giving such invisible hairwire a try . . . . . VK1VU assures all contacts QSLs as soon as his log returns from Heard Island. Ron tells W9KOK that his last name is Oatt and not Gatt as widely published . . . . . LU3BAC deplores the lack of Utah and Delaware activity on ten- and twenty-meter 'phone while DL1BD would settle for N. Mex., Utah, Wyo. and both Daks. on 14-Mc. c.w. WAS is still in great demand we see . . . . . W1DJV notes that EQ2L of the U. S. Embassy in Teheran is engaging in zealous missionary work on behalf of amateur radio with the Iran authorities. We wish him luck in securing more signals from that part of the world . . . . . You may confirm contacts with HC1KE, including those up through 10 June, 1950, by writing Alex at the address listed in the "Where" section . . . . . ZS6VMO, the station set up at the Voortrekker Monument unveiling on Monument Koppie last December, worked a total of 360 stations. Because of poor conditions prevailing at the time, just 30 of these were of a DX nature. The lucky stations have received QSLs of unique design and their own cards will remain permanently on exhibit at the memorial . . . . . The *Asociación de Radio-Aficionados de Oriente* in Cuba has several familiar DX calls on their officers' roster: president CO8BF, vice-president CO8UV, secretary CO8BC, vice-secretary CO8DL . . . . . If you haven't heard, the *Liga Panameño de Radio Aficionados* will furnish a certificate of merit to anyone submitting proof (QSLs) of contacts with 20 HP stations. Even though they're becoming more numerous this should be a tough one to crack . . . . . HZ1AU believes his QSL debts have all been paid and he hopes to resume activity in the near future. DL4ND hinted to W6AM that there may be another 3A1A session in store for us in early September . . . . . Made official by French authorities according to the No. Calif. DX Club's *DXer* are the following prefixes: French Antaretica and the Comoro Islands, FB8; Clipperton Island, FO8; Corsica, FC . . . . . U. S. 'phone DX men will be interested to note that FCC citations have been forthcoming in instances where noncitizens were allowed to converse with noncitizens at DX points via ham radio. Anything new in regulations along this line may be kept up to date by regular listens to W1AW bulletins . . . . . Don't overlook the announcement of the coming VK/ZL DX Contest on page 49 of this issue.

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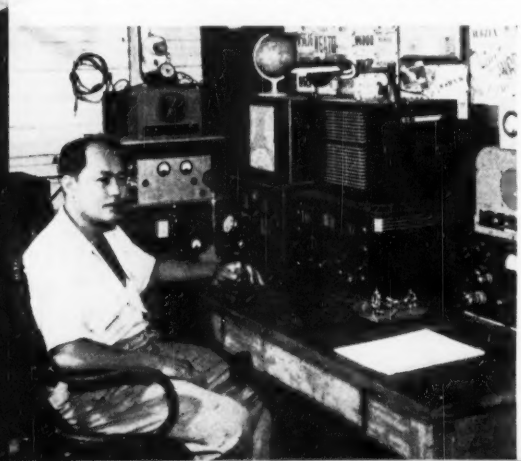
You may recall that shortly after W1DX's erudite yarn concerning a fictional ZD9AA appeared in a past *QST* a real ZD9AA put in his appearance on 14 Mc. Now Jeeves sits up all night in the dark of the moon tuning the two-meter range for flying saucers.



Jess Escalante, DU1VSS, is one of the more active Manila amateurs on 10- and 20-meter 'phone and c.w.

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16th ARRL DX Contest

PART I: *Final Results — C. W. Section*

How high can scores go in an ARRL DX Contest? That question comes to mind each year when we analyze entries in these periodic contests of DX operating skill. And each year we say to ourselves in answer, "This is it. We've reached the leveling-off point. It's impossible for scores to go any higher!" We've been wrong every time! Scores *do* reach new heights from contest to contest. All of which proves that impossible goals have just not appeared on the DX Contest horizon, at least not for the experienced DX operator who comes up annually with new score records or the neophyte who keeps improving his performances in an attempt to break into the top score brackets. It all adds up to the fact that these contests are great builders of operator-station performance. If DX is your meat, you'll continue taking part and become more skilled as time goes on; if you're new to DX operating, you just haven't been indoctrinated in the game until you've come through your baptism of fire in an ARRL DX Contest!

The c.w. portion of the 16th ARRL DX Competition conformed perfectly to the pattern just outlined. Its enthusiastic participants produced new score, contact and multiplier records. In addition, the contest was one in which sportsmanship and clean operating were outstanding. There were fewer disqualifications for out-of-band operation than last year; 43 contestants were tagged off frequency compared to 62 in 1949.

In accordance with a long-standing policy, competition for awards was confined to participants within each ARRL mainland section and in each country outside the W/VE/VO area from which qualifying entries were received. The total number of c.w. contest reports received was 1065 (770 W/VE/VO, 295 foreign). Awards are being given to 67 entrants in the W/VE/VO area and to 75 contestants outside the U. S. and Canada. The calls of all awards winners are listed in the accompanying score tabulations.

Highlights

In the U. S.-Canada area, W3LOE set a new score record with 434,073 points, to outclass the previous high of 390,450 points made in the 1949 contest. Bob also topped all previous W/VE/VO contact records by making 563 QSOs and shared honors with W3BES and W4KFC for being the first to go over the 500 mark.

The following tabulation lists the high scorer in each U. S. and Canadian licensing area:

W1JYH	207,675	VE1PQ	64,980
W2BXA	298,102	VE2WW	153,546
W3LOE	434,073	VE3KE	111,262
W4KFC	365,454	VE4RO	212,352
W5ENE	202,584	VE5QZ	42,588
W6RM	266,448	VE6AO	22,446
W7VY	229,125	VE7VO	220,248
W8BHW	365,807	VE8AY	12,015
W9LM	229,308	VO6EP	2184
W0DAE	232,638		

Leaders in number of contacts were W3LOE 563, W3BES 543, W4KFC 514, W8BHW 499, W2BXA 465, W8BTI 458, W6RM 427, VE4RO 422, W4BRB 421, W0DAE 406, W8DX 402, VE7VO 399, W9LM 394, W7VY 393, W6CEM 392, W9FJB 384, W4OM 377, W3GHD 373, W0NUC 372, W6MVQ 371, W6TT 369, W5ENE 367, W2WZ 366, W3CPV 366, W1RY 364, W3GRF 364, W0GDH 362, W1BIH 360, W1BIL 355, W1JYH 355, W9GA 354, W3JTC 350.

Highest multipliers (sum of countries worked totals for each band) in W/VE/VO: W3LOE 257, W3BES 249, W8BHW 247, W4KFC 237, W8BTI 215, W2BXA 214, W6RM 208, W4BRB 198, W1JYH 195, W7VY 195, W8DX 195, W9LM 194, W2WZ 192, W0DAE 191, W6CEM 190, W3CPV 187, W1RY 184, W3GHD 184, W5ENE 184, W0NUC 184, VE7VO 184, W9FJB 182, W6ITY 180, W1BIH 178, W3JTC 178, W6IBD 178, W9GRV 177, W9GA 176.

Outside the U. S.-Canada area, the top scorers in each continental area were as follows: *Asia* — JA2CK 159,432; *Africa* — EK1AO 242,394; *Europe* — GW3ZV 357,186; *North America* — XF1A 726,530; *Oceania* — KH6IJ 517,824; *South America* — CE3DZ 296,140.

Top contact totals outside W/VE/VO: KV4AA 2544, XF1A 2500, GW3ZV 2018, KH6IJ 1984, ON4QF 1673, ZL1BY 1615, ZL1MB 1559, KH6MG 1531, OK1FF 1498, CE3DZ 1474, EI9J 1384, VK2EO 1364, FA8BG 1296, HC1PK 1220, EK1AO 1149, FA8IH 1097, KZ5PA 1071, ZS5YF 1056, JA2CK 1022, PA0EP 1021, KL7PB 1013, CE2DY 1010, GW5SL 1006, ZS6CT 1006, PY2AJ 1005.

The highest multiplier reported from outside W/VE/VO was that of XF1A, 97, which sets a new record. Juan used all bands from 160 through 10 meters, and certainly did a noteworthy job of approaching a possible multiplier of 114 for operation on these bands. Other high multipliers: KV4AA 91, XE2N 91, KH6IJ 87, KH6MG 79, KZ5PA 77, HC1PK 74, EK1AO 71, VK2EO 71, PY2AJ 69, LA7Y 68, CE3DZ 67, ZL1BY 67, KS4AC 64, KL7PB 62, CE2DY 61, KX6BA 61, VP6SJ 61, EI9J 60, FA8BG 60, OK1FF 60, ZL1MB 60.

Disqualifications

The following entrants are deemed ineligible for c.w. score listings or awards in the 1950 DX Competition. In each case the disqualification is for off-frequency operation as confirmed by a single FCC citation or advisory notice or two

accredited ARRL Official Observer measurements:

W1s AQE GVK OCV RWS, W2s AW CGJ TVA, W3s GHS OCU WU, W4s IA OWE, W6s CYI MEK, W8QZV, W9s AEW DUY, W0YCR, VE1s EK HO KN ZZ, VE2s NI OL, VE3s ABF HB, VE4XO, VE6MC, VE8MF, DL1OA, DL3CO, EA4CN, F3CX, F8EJ, G2AJ, G6GN, I1AIV, LA4P, OK2OL, PA0VB, PK4OO, SP5ZPZ, YO3RI.

Sidelights

Antennas, as always, were important in DX Contest operations. Here's a list of those in use at W3LOE: 27 and 28 Mc. — three-element rotary; 14 Mc. — four-element rotary; 7 Mc. — double-section 8JK for Europe and Southwest Pacific plus two half waves in phase for South America; 3.5 Mc. — single-section 8JK for Europe and Pacific coverage. The W2s really go in for high-gain 28-Mc. antennas: W2AW, W2FBA, and W2VQM employed eight-element jobs on that band. If the Europeans looking for U. S. contacts on 7 Mc. missed working W2FBA, it wasn't his fault; he used a four-element fixed array aimed at them! . . . XF1A undoubtedly holds the all-time record for QSOs-per-hour in any contest; in this one he had 91 contacts from 11:08 to 12:07 A.M. CST, February 11th! Juan's best minute netted five contacts at 11:17 A.M. the same day. . . . The most elaborate homebuilt receiver used in the contest was probably that of W3FYS — a 24-tube job. None of your manufactured receivers for W3LOE, either; he used a 15-tube double-conversion job and a 16-tube single-conversion superhet. W8DX, Michigan award winner, also believes in "rolling his own" receiver; the DX arrived at his shack via a composite, triple-conversion superhet with variable cut-off and low-pass audio filter. . . . W6AM worked XF1A on all six bands from 160 through 10. . . . GW3ZV, top European scorer, believes in having a few good antennas for the contest. His layout sported a three-element rotary and a Sterba curtain for 28 Mc., a four-element rotary on 14 Mc., vee beams on 3.5 and 7 Mc., and a 900-foot-long receiving antenna!

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October *QST* will contain Part II of the 1950 DX Contest results: the 'phone scores, outcome of the club competition, and photographs of leading performers in both the c.w. and 'phone portions of the contest. — *J. M.*

C.W. SCORES

Sixteenth International DX Competition

Operator of the station first-listed in each section and country is winner for that area, unless otherwise indicated. . . . Asterisks denote stations not entered in contest, reporting to assure credit for stations worked. . . . The multiplier used by each station in determining score is given with the score — in the case of U. S.–Canada this is the total of the countries worked on each frequency band used; in the case of non-W/VE/VO entries it is the total of the U. S.–Canada districts worked on each band. . . . The number of contacts established is next listed. . . . The letters A, B, and C approximate the input to the final stage at each station: A indicates power up to and including 100 watts; B indicates over 100 watts up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score . . . Example of listings: W3BES 404,127-249-543-C-86, or final score 404,127; multiplier 249; 543 contacts; power over 500 watts; total operating time 86 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator station listings in each section or country tabulation; calls of participants at multioperator stations are listed in (parentheses).

ATLANTIC DIVISION

E. Pennsylvania

W3BES 404,127-249-543-C-86
W3GHD 205,896-184-373-B-70
W3CPV 205,326-187-366-C-70
W3DOE 164,340-166-330-C-68
W3EQA 135,880-158-288-C-68
W3KT 116,208-144-269-C- -
W3FUF 111,339-139-267-C-59
W3HRD 92,752-136-230-C-54
W3INL[1] 89,792-122-246-B- -
W3HER 81,396-114-238-B-68
W3DGM 65,190-106-205-B-40
W3ALB 62,784-109-192-C-40
W3LXN 53,298- 91-189-B- -
W3NOH 51,585- 95-181-C-40
W3BXE 45,360- 93-168-B-26
W3KEW 34,932- 82-142-C-34
W3AFW 31,360- 70-150-C-50
W3CGS 23,616- 64-123-C-37
W3EVW 21,228- 58-122-C-20
W3ML W 18,205- 55-111-B-47
W3CTJ 14,334- 54-107-C-20
W3QDZ 16,575- 65- 85-C-23
W3QLW 15,900- 50-106-B-33
W3FLH 15,150- 50-101-C-30
W3PN 13,800- 50- 92-A-13
W3ALX 12,690- 47- 90-B- 8
W3CHH 9752- 46- 72-B- -
W3NOK 7956- 39- 68-B-25
W3IMV 7854- 34- 77-B-40
W3OSE 6195- 35- 59-A-30
W3CLT 5511- 33- 57-B-11
W3GRS 4230- 30- 47-B- 7
W3KDF 3567- 29- 41-B- 5
W3RQN 3213- 27- 49-B-25
W3BTP 2640- 20- 44-B-10
W3DTE 1125- 15- 25-A-21
W3NA 840- 14- 20-C-12
W3LVF 612- 12- 17-B- 2
W3MAC 105- 5- 7-A- 5
W3SSU 6- 1- 2-A- 5
W3NKU (W3s MYL PKA) 40,672- 82-166-C-46
W3ITW (W3BIP) 33,075- 75-147-B-27

Md.-Del.-D.C.

W3JTC 186,900-178-350-C-70
W3GRF 185,055-169-364-B-80
W3IYE 170,829-171-333-B-65
W3FQZ 167,118-173-322-C-72
W3JKO 154,524-158-326-B-68
W3BVN 153,220-163-314-B-75
W3KDP 113,702-139-274-C-56
W3PDX 84,864-128-221-B-64
W3AOO 80,730-117-230-B-39
W3VES 80,230-113-237-A-55
W3EIS 78,624-122-224-C-49
W3FQB 76,705-115-223-A-65
W3WV 73,789-113-219-B-58
W3DRD 70,851-113-209-C-39
W3PWR 63,954-102-209-C-60
W3BEN 66,144-104-212-C-60
W3JHW 31,434- 74-135-B-40
W3LIL 28,186- 87-109-B-19
W3FYS 26,499- 73-121-C-26
W3EPR 21,038- 67-108-B-37
W3AEL 19,529- 59-111-B- -
W3CDG 15,000- 50-100-B-37
W3JTK 11,178- 54- 69-C-18
W3LVJ 6615- 35- 63-A-13
W3DYL 4928- 28- 59-B-17
W3HVM 4743- 31- 51-A-20
W3FY 4416- 32- 46-B-10
W3CDZ 4410- 30- 49-A-15
W3ONU 3108- 28- 37-B- 9
W3MNO 2736- 24- 38-B-16
W3IIL 1701- 21- 27-B-10
W3MCG 741- 13- 19-A-12
W3PEV 672- 14- 16-A-20
W3DQB 660- 12- 19-A-13
W3PZA[2] 429- 11- 13-B- 4
W3BVO 300- 10- 10-B- 8
W3ONQ 238- 7- 12-B- 8

So. New Jersey

W2RGV 139,062-154-301-B-72
W2GGL 81,396-114-239-C-62
W2YTH 72,439-107-227-B-43
W2QKE 26,199- 71-123-C- -
W2HAZ 3482- 27- 43-B- -
W2ZVW 2970- 30- 33-A- -
W2VUM 2709- 21- 43-B-15
W2SUA (W2TNN) 71,379-103-231-B-88

W. New York

W2FBA 164,730-170-323-B-46
W2DSB 124,436-154-278-C-65
W2MA 72,186-106-227-C-65
W2MEW 51,216- 97-176-C-68
W2QXB 39,501- 77-171-B-57
W2EWT 33,975- 75-151-C-37
W2QHH 28,188- 81-116-A- -
W2TVR 22,506- 62-121-B-47
W2FE 19,980- 60-111-A-36
W2VQM 18,585- 59-107-C- -
W2TXB 16,638- 47-118-C-30
W2QCP 15,120- 60- 84-B-19
W2PJM 9504- 48- 66-B-17
W2PZN 9040- 40- 76-B-24
W2RQH 8118- 41- 68-C-13
W2AXR 7605- 39- 65-C-24
W2QJM 5460- 35- 52-B-12
W2QQ 4704- 28- 56-B-12
W2KEL 4455- 33- 45-B-14
W2RUK 2268- 18- 42-A- 9
W2REF 2112- 22- 32-B-12
W2PYC 264- 8- 11-A- 3
W2VGM 108- 4- 9-A- 5
W2ZSG (W2s COU YRH Adam Gaus) 18,228- 62- 98-B-96

W. Pennsylvania

W3LOE 434,073-257-563-C-85
W3LNE 72,750-125-194-C-69
W3AAX 41,076- 84-163-C-66
W3LPF 38,015- 85-153-C-40
W3LVU 10,647- 39- 91-B-26
W3TXQ 8256- 43- 64-B-15
W3KQD 8214- 37- 74-B-15
W3AVY 1539- 19- 27-B-19
W3LOR 1395- 31- 15-B- 6
W3WJF 432- 12- 12-A- -
W3ODU 231- 7- 33-A- -
W3OEP (W2CDW W3LQZ) 30,222- 69-146-B-56
W3YA (W3s KCV NGZ NSJ) 2664- 24- 37-C-14

CENTRAL DIVISION

Illinois

W9LM 229,308-194-394-C- -
W9FJB 209,664-182-384-C-70
W9GA 186,912-176-354-C- -
W9GRV 184,788-177-348-C-80
W9NH 158,273-163-324-C-67
W9CIA 65,607-121-189-C-63
W9FID 36,208- 73-167-C-55
W9HUZ 34,444- 70-146-B-50
W9GMZ 34,207- 79-145-B-42
W9FKC 20,160- 56-120-C-18
W9MGY 13,674- 53- 86-C-41
W9FAU 9198- 42- 73-C- -
W9POP 8436- 38- 74-C- 8
W9NJZ 6720- 32- 70-B-30
W9OLU 5202- 34- 51-B- 8
W9ALI 4650- 31- 50-B-20
W9BDV 3510- 30- 39-B-25
W9KMN 2871- 29- 33-B-22
W9VPD 1890- 21- 30-C- 9
W9JNC 1242- 18- 23-B- 8
W9FZE 952- 17- 22-B-10
W9TAL 420- 10- 14-A- 4
W9TMU 396- 11- 12-C-11
W9WIO 378- 9- 14-B- 4
W9KXD 210- 7- 10-B- 3
W9QJR 147- 7- 7-B- 5
W9FWV 90- 5- 6-B- 9
W9IRR 40- 4- 4-B- 6

Indiana

W9FWS 53,636- 92-195-B-80
W9ROF 32,193- 73-147-B-48
W9UC 20,349- 57-119-B-34
W9VW 15,453- 51-101-C-10
W9SFR 8568- 34- 84-B-15
W9WCE 4125- 25- 55-B-18

Wisconsin

W9ROM[3] 170,340-167-340-B-60
W9RBI 148,302-154-321-B- -
W9LNM 134,547-149-301-B-74
W9RQM 115,020-142-270-C-54
W9BQM 21,760- 64-114-A-43
W9KXK 19,488- 58-112-A-40
W9YMG 15,390- 45-114-C-23
W9WEN 10,293- 47- 73-B-19
W9WJH 6435- 39- 55-A-20
W9HHN 3588- 28- 46-B-15
W9ERW 288- 8- 12-A-16
W9MDG 192- 8- 8-B- 7
W9HDZ 3- 1- 1-A- 1

DAKOTA DIVISION

No. Dakota

W0CAQ 27- 3- 3-B- 2

So. Dakota

W0NGM 264- 8- 11-C-10

Minnesota

W0RXL 117,438-138-287-C-77
W0JSN 29,565- 73-135-B-39

W0DGH 14,976- 52- 96-B- -
W0HIE 12,792- 52- 82-B-19
W0TKX 7525- 43- 59-B-16
W0VIP 4224- 32- 44-B-15
W0BRA 1701- 21- 27-B-

DELTA DIVISION

Arkansas

W5PYU 5487- 31- 59-B-21
W5DRW 4860- 36- 45-C-12
W5BXN 4320- 32- 45-C-27
W5DYF 1235- 19- 22-B- 5

Louisiana

W5KC 109,746-134-273-C-60
W5BRR 88,146-118-249-C-60
W5CGC 11,118- 51- 74-C-28
W5KWY 6588- 36- 61-B-15
W5CEW 5500- 34- 51-C- -
W5LUU 5106- 37- 46-B-20
W5OM 4290- 26- 55-B-16
W7PBW 4032- 32- 42-C-20

Mississippi

W5CKY 151,164-156-323-C-62
W5ZD 69,690-115-202-B- -

Tennessee

W4DQH 111,529-136-274-C-58
W4LHQ 10 395- 55- 63-A-17
W4NNJ 9045- 45- 67-B-20
W4CVM 2002- 22- 31-C-18
W4ONX 918- 17- 18-C-30

GREAT LAKES DIVISION

Kentucky

W4PN 80,196-123-218-C-44
W4NKQ 64,890-103-210-B-49
W4KKG 50,052- 86-194-C-35
W4YFA 43,146- 94-153-C-77
W4LQF 1530- 18- 29-B-14

Michigan

W8DX 234,780-195-402-B-84
W8CVU 123,291-133-309-B-59
W8DAW 80,379-117-229-C-56
W8LEA 57,036- 97-196-C-40
W8UPN 33,300- 75-148-C-38
W8BGY 32,058- 78-137-C-20
W8CCJ 27,300- 70-131-A-60
W8RRP 23,730- 70-113-B-23
W8IQS 16,560- 57- 95-B-44
W8OCA 15,510- 55- 96-C-37
W8HPH 10,650- 50- 71-B-32
W8SY 8100- 45- 60-C-12
W8SS 7254- 39- 62-C-29
W8NML 2940- 28- 35-B-11
W8EXZ 1767- 19- 31-A-20
W8QFH 1728- 16- 36-B-21
W8MCC 945- 15- 21-B-19
W8CLH 572- 13- 15-A-20
W8DSE 182- 7- 9-B-15
W8SOE (W8BDF) 13,197- 53- 83-C-17

Ohio

W8BHW 365,807-247-499-C-79
W8BTI 295,410-215-458-C-72
W8BNA 77,361-107-241-B-60
W8ZJM 60,795-105-193-B-55
W8NSS 54,270- 90-201-B-46
W8EYE 44,550- 90-165-B-50
W8WWU 35,261- 79-153-B-40
W8PM 33,228- 78-142-B-32
W8AJW 25,060- 70-120-A-29
W8DQC 24,192- 64-126-B-24
W8DAE 24,012- 69-116-B-34
W8ACE 18,711- 63- 99-C- -
W8QYI 16,335- 55- 99-B-18
W8HFE 15,309- 63- 81-C-13
W8KC 10,944- 48- 76-B-45
W8STL 10,363- 43- 81-C-24
W8ICC 9804- 43- 76-B-23
W8BNJ 8880- 37- 80-B-20
W8OG 8742- 47- 62-B-12
W8LCO 8541- 39- 73-B- -
W8AL 7200- 36- 67-B-24
W8EKK 7200- 40- 60-B-37
W8ZCK 4726- 34- 47-A-21
W8BUM 4257- 33- 43-C-15
W8TPS 3864- 28- 46-B- -
W8ZWX 2835- 27- 35-B-13
W8KJK 2772- 28- 33-B- -
W8BSR 2331- 21- 37-B-14
W8YGR 2001- 23- 29-A- -
W8ARO 1748- 23- 26-A-26
W8DWP 1566- 18- 29-A-18
W8JFC 1476- 18- 28-B- 5
W8YPT 1380- 20- 23-B- 5
W8CSA 900- 15- 20-B-20
W8ZJO 828- 12- 23-C- 8
W8HGW 560- 16- 17-C- -
W8DMD 319- 11- 15-B- -
W8DNC 288- 8- 12-A- 7
W8PCS 231- 7- 11-B- 3
W8EGI 105- 5- 7-B- 2
W8CBI 75- 5- 5-B- -
W8AVT 27- 3- 3-A- 1
W8CGG 12- 2- 2-A- 1
W8VZE 12- 2- 2-B- 1
W8URD (W8s YPT ZKK ZQH) 5216- 32- 55-B-24

HUDSON DIVISION

E. New York

W2DSU 112,827-143-263-B-59
W2AWF 90,000-120-250-B- -
W2BYP 82,782-126-219-C-58
W2CJM 42,133- 91-155-B-40
W2OAA 2208- 23- 32-B- 4
W2BZO 1245- 17- 25-B- -
W2HCM 756- 14- 18-A-13
W2TER 330- 10- 11-A- 8
W1MKR/2 266- 7- 13-A- -
W2ZQR 147- 7- 7-A- 5

N.Y.C.-L.I.

W2WZ 210,816-192-366-C-64
W2PBG 150,552-153-328-C-78
W2CSO 75,900-115-220-C-23
W2EGG 72,287-109-221-C-75
W2GTL 67,628-106-213-B-49
W2GSN 66,660-100-222-B-43
W2CTO 33,726- 77-148-B-40
W2WC 29,304- 74-132-B-25
W2HAQ 27,738- 67-138-B- -
W2CLA 16,170- 49-110-C-19
W2ALB 15,337- 49-105-B-37
W2ESO 12,064- 52- 78-B-20
W2EQG 6840- 40- 57-B-18
W2BWC 6486- 46- 47-B- 7
W2YDG 6120- 34- 60-A-10
W2SLU 4530- 30- 52-A-27
W2SNV 4292- 29- 50-B-35
W2KZE 3672- 24- 51-A-18
W2AJI 2706- 22- 41-B-24
W2DBI 2331- 21- 37-A-12
W2TUF 2289- 21- 37-A-15
W2ETT 2139- 23- 31-A- 7
W2ZSD 1581- 17- 31-A-10
W2JB 1566- 18- 29-B- 6
W2NHH 1246- 14- 31-A-28
W2ROJ 1026- 18- 19-B- 8
W2GP 936- 13- 24-A-10
W2FCT 828- 12- 23-A- 7
W2VDT 351- 9- 13-A- 4
W2TUK 18- 2- 3-A- 1

No. New Jersey

W2BXA 298,102-214-465-C-63
W2ATE 112,995-135-283-B-59
W2GNQ 104,910-130-269-B- -
W2EQS 73,676-113-219-A-84
W2DJT 70,510-110-246-B-46
W2TSL 66,144-104-212-C-55
W2JME 41,574- 82-169-B-47
W2KHT 30,258- 82-123-B-31
W2SQT 28,575- 75-127-B-53
W2CYS 27,075- 75-121-C- -
W2GKE 18,900- 54-117-B-34
W2FFN 16,072- 56- 96-B-55
W2LTP 15,696- 48-109-C- -
W2TWC 10,032- 38- 90-A-32
W2CWK 9024- 47- 64-A-20
W2VJM 7740- 43- 60-B-24
W2HMN 4752- 24- 66-B-27
W2VYB 4671- 27- 59-A-22
W2BU 3600- 25- 48-C- 9
W2NIY 3050- 25- 41-A- -
W2ZEP 3000- 25- 40-A-13
W2OPT 2898- 21- 46-B-10
W2HTX 2618- 22- 40-B-19
W2JMC 2442- 22- 37-B-14
W2ADP 1953- 21- 31-B- -
W2EWZ 1632- 17- 32-B- 5
W2ABL 576- 12- 16-A- 8
W2HXU 528- 11- 16-B- 6
W2SOY 378- 9- 14-A- 5
W2YOB 36- 3- 4-A- 5
W2AIY 6- 1- 2-A- 3
W2PXR (W2BLL) 80,880-120-229-C-90

MIDWEST DIVISION

Iowa

WØNUC 295,344-184-372-C-90
WØFDL 71,154-118-201-C-43
WØFGW 11,520- 48- 89-B-46
WØDIB 2376- 24- 37-B-18

Kansas

WØDAE 232,638-191-406-C-65
WØGDH 201,996-186-362-C-58
WØVBQ 28,080- 72-133-B-30
WØFET 16,632- 66- 84-B-16
WØERI 13,689- 48- 93-C- -

Missouri

WØGYL 56,490-105-180-B-21
WØBMM 33,930- 78-145-C-70
WØBAF 33,015- 69-145-B-40
WØBTD 26,341- 71-124-B-40
WØDU 24,576- 64-128-B-37
WØBPA 17,670- 62- 95-B-40
WØARH 15,000- 50-101-B-34
WØAJU 10,912- 44- 84-C-30
WØVAV 5580- 33- 62-B-35
WØFUM 2700- 23- 6-C-16

Nebraska

WØBBS 21,576- 62-116-C-58

NEW ENGLAND DIVISION

Connecticut

W1RT 200,928-184-364-B-65
W1BIH 192,240-178-360-C-60
W1LOP 162,288-161-336-C-63
W1AB 124,410-145-286-C-59
W1FTX 103,776-138-252-B-45
W1TX 94,815-129-248-B-48
W1DF 87,438-118-247-B-46
W1NMP 67,266-101-222-C-33
W1LVQ 61,800-100-207-B- -
W1AQT 44,160- 92-160-B-49
W1DX 43,848- 87-168-C-33
W1CEG 41,565- 85-163-B-50
W1AH 32,725- 77-143-C-37
W1ODW 31,284- 79-132-A-63
W1DEP 23,460- 67-132-B- -
W1CUH 20,064- 57-118-B-47
W1NJM 17,877- 59-101-B- -
W1AYR 14,892- 51- 90-C- 9
W1AJO 14,784- 44-112-B-25
W1NLM 11,880- 40- 99-A-30
W1APA 10,374- 42- 83-C-27
W1HDQ 9126- 39- 78-B-20
W1BUD 6519- 41- 53-A- -
W1QIS 6018- 34- 61-A-15
W1JTD 3159- 27- 39-B- -
W1CNU 1716- 22- 26-B- 5
W1QVF 855- 15- 19-A- 3
W1FWH 384- 8- 16-B- 3
W1BDI 12- 2- 2-A- 1

Maine

W1SNV 131,130-141-310-B-50
W1DPJ 57,120- 96-199-C-58
W1GKJ 14,664- 52- 94-B-30
W1NXX 9045- 45- 67-A-18
W1APU 8487- 41 -69-B-15
W1NKM 2205- 21- 35-B-45

E. Massachusetts

W1AXA 146,772-162-302-B-80
W1BOD 129,930-142-305-B-62
W1QPB 123 662-146-286-C-60
W1DDO 45,300-100-151-A-54
W1ALA 32,340- 70-154-B-28
W1NW 31,824- 78-136-C-37
W1ICA 10,972- 62-103-A-20
W1NIY 10,200- 54-100-B-24
W1HA 11,046- 42- 91-C-13
W1JCE 7557- 33- 77-A-17
W1PWK 6664- 34- 67-A-12
W1LML 4455- 27- 55-B-20
W1ONP 3300- 25- 44-B-14
W1HZ 2700- 25- 36-A- 5
W1BGW 2178- 22- 33-C- 8
W1RXB 1800- 20- 30-A-16
W1JBI 1224- 17- 24-B- 9
W1RGY 450- 10- 15-A- -
W1BB 36- 3- 4-B- 2
W1LQ (W1FI) 31,514- 73-140-B-33

W. Massachusetts

W1JYH 207,675-195-355-B-60
W1ZD 105,726-134-263-C-64
W1JLT 67,628-106-213-B-64
W1EOB 64,974-119-182-B-39
W1QDE 35,175- 75-157-B-55
W1RF 18,300- 60-103-C-18
W1EFQ 14,535- 51- 95-C-19
W1MUN 14,352- 52- 92-C-18
W1RRV 7646- 42- 61-B-20
W1ASU 6142- 37- 56-B-35
W1DGT 5670- 35- 54-A-21
W1MVF 3762- 33- 38-B-14
W1OPJ 564- 12- 17-A- 5
W1JR 261- 9- 10-A- 3
W1RZG 210- 7- 10-A- 6
W1RHU 33- 3- 4-A- 5

New Hampshire

W1BFT 170,352-168-338-B- -
W1JIY 15,463- 47-111-B-30
W1CDX 11,025- 49- 75-B-12
W1CRW 10,710- 51- 70-C-10
W1EWF 8170- 43- 64-C-37

Rhode Island

W1BIL 176,624-166-355-B- -
W1CJH 134,088-148-302-C-68
W1QOG 35,640- 72-165-A-62
W1KUF 27,669- 69-135-B-20
W1AWE 14,145- 45-107-C- -
W1RFQ 1440- 16- 30-A- -

Vermont

W1EZ 93,666-134-233-B-52
W1FPS 2940- 28- 35-B-24
W1BJP 8040- 40- 67-B- -
W1FGO 924- 14- 22-B- -

NORTHWESTERN DIVISION

Idaho

W7FBD 3870- 30- 43-B-10
W7IY 360- 8- 15-B-40

Montana

W7EOI 23,628- 66-120-C-58
W7KOR 18,762- 59-106-B-53
W7HZS 6903- 39- 59-B-23
W7JFR 2220- 20- 37-A-21
W7FLB 1742- 18- 33-B-32
W7GFV 1145- 15- 27-B-13

Oregon

W7MLJ 18,939- 59-107-B-50
W7AXJ 15,912- 52-102-C-47
W7GHB 12,320- 55- 75-B-53
W7ENW 9960- 40- 83-C-19
W7MO 6384- 38- 58-B- -
W7JLU 2852- 23- 42-A-22
W7HBO 2730- 26- 35-B- 6
W7LNG 1560- 20- 26-A-19
W7KVU 41,850- 90-155-C-47

Washington

W7VY 229,125-195-393-C-85
W7DL 151,044-164-307-C-79
W7HJC 54,150- 95-190-C-60
W7BGH 43,788- 82-178-B- -
W7NLI 27,750- 74-125-B-60
W7LEV 11,352- 44- 86-B-30
W7CNM 10,557- 51- 69-B-26
W7HLU 3780- 30- 42-B-16
W7CAB 3750- 25- 50-B-24
W7GVV 3024- 24- 42-B-12
W7JC 2961- 21- 47-A-22
W7EW 264- 8- 11-B- 4
W7LCS 36- 3- 4-A- 3

PACIFIC DIVISION

Santa Clara Valley

W6CEM 222,680-190-392-C-90
W6QMC 127,650-150-285-C- -
W6VE 61,812-102-202-C- -
W6JWT 52,992- 92-192-C-90
W6AOD 27,336- 67-136-C- -
W6SR 26,325- 65-135-B-60
W6MDY 14,490- 46-105-B-54
W6AMO 14,400- 50- 96-A-40
W6MX 7132- 41- 52-C- -
W6LSX 6912- 36- 64-C- -
W6YHB 3906- 31- 42-B-29
W6HKG 224- 8- 10-B- 7

East Bay

W6RM 266,448-208-427-C-86
W6MVQ 215,922-194-371-C- -
W6TT 202,581-183-369-C-80
W6PB 115,824-146-265-C-40
W6CTL 85,789-121-237-C-43
W6KEK 79,056-122-216-C- -
W6LDD 61,776- 99-208-C-80
W6PYH 58,506- 98-199-C-40
W6MHB 51,531- 89-139-B-80
W6QDE 48,427- 89-181-C-55
W6RCC 44,322- 82-178-C-63
W6YI 27,450- 75-122-C-46
W6TI 16,524- 54-102-C-23
W6LMZ 12,900- 50- 86-B-20
W6VDG 10,710- 51- 70-B-32
W6FLT 10,455- 41- 85-B-35
W6EJA 8085- 35- 77-B-21

San Francisco

W6WB 130,980-143-295-C- -
W6ATO 62,685-107-199-C-80
W6GPB 27,675- 75-123-A-45
W6YC 11,546- 46- 85-B-24
W6MUF 4278- 31- 47-B-17
W6JB 900- 12- 25-C-16
W6LV (W6MZ) 73 590-110-223-C-59

Sacramento Valley

W6EFM 72,240-112-215-C-65

San Joaquin Valley

W6KTW 9963- 41- 81-C- -
W6SRU 9646- 53- 62-C-35
W6EPQ 5244- 35- 46-B-16
W6ALQ 294- 7- 14-B-11

ROANOKE DIVISION

North Carolina

W4GXB 107,736-134-268-B-34
W4CEN 92,475-135-229-B-55
W4IZR 18,306- 54-113-B-35
W4OFG 8118- 41- 66-B-11
W4AEH 1050- 14- 25-B- 8
W4PRL 168- 7- 8-A- 5

South Carolina

W4AES 62,712-104-201-B-38

Virginia

W4KFC 361,454-237-514-C-82
W4OM 209,235-185-377-C- -
W4LRI 71,259-111-223-B-50
W4JFE 71,712-108-222-C-48
W4KFT 44,115- 85-173-B-54
W4NNN 34,935- 85-137-B- -
W4NQV 33,970- 79-144-A-48
W4KWY 13,356- 38- 84-C- -
W4IWO 12,126- 43- 94-B- -
W4FV 11,232- 52- 72-B- -
W4FF 9288- 43- 72-B-12
W4LAP 4851- 33- 49-A-20
W4UO 4590- 34- 45-B-14
W4KOQ 3528- 24- 49-A-38
W4EMJ 1188- 18- 22-B- 7
W4LUE 900- 15- 20-C- 2
W4KYD 840- 14- 20-B-10

W4KMS 504- 12- 14-B- 5
W4JUY 135- 5- 9-B- 2
W4IWS 60- 4- 5-B- 5
W4PVJ 18- 2- 3-A- 2
W4VE (W4CC) 77 952-112-232-B-58

West Virginia

W8PQQ 171,708-164-349-C-36
W8JM 10,920- 52- 70-B-22
W8WSL 2136- 24- 31-B- -

ROCKY MOUNTAIN DIVISION

Colorado

WØAZT 69,834-113-206-B- -
WØCDP 5643- 33- 57-B-17
WØKV 1125- 15- 25-B- 9
WØTYE 1071- 17- 21-B-24
WØIC 840- 14- 20-B- 5

Utah

W7ORH 12,126- 47- 86-B-50

SOUTHEASTERN DIVISION

Alabama

W4NUI 6426- 34- 63-B-28

E. Florida

W4BRB 250,074-198-421-C-80
W4IZ 101,136-129-262-C-56
W4LVV 79,178-118-224-C-70
W4FPK 72,207-113-213-B-42
W4CQR 66,465-105-212-B-46
W4LNE 35,424- 72-164-B-49
W4AZK 20,679- 61-113-C-23
W4EEW 7560- 35- 72-C-15
W4LQN 5952- 32- 62-C-17
W4CGY 4368- 28- 52-B-24
W4CKB 3978- 34- 39-B- -
W4POF 3770- 26- 49-B-12
W4DRK 450- 10- 15-B- -
W4IYT 450- 10- 15-B- 3
W4EEO 243- 9- 9-B-10
W4QED 21- 3- 3-B- 2

W. Florida

W4BGO 144,054-159-302-C-68
W4NN 51,500-100-173-B-58
W4CDE 13,254- 47- 94-B-32
W4QGH 867 17- 17-C- -

Georgia

W4DCZ 122,640-146-282-C- -
W4DXI 89,000-125-240-C-79
W4EV 54,800-100-183-B-47
W4ZD 48,960- 85-192-B-88
W4JDR (W4FIJ) 130,092-148-293-C-80

SOUTHWESTERN DIVISION

Los Angeles

W6IBD 177,822-178-333-C- -
W6KRI 150,696-161-312-C-68
W6ANN 127,185-139-305-C-57
W6NNV 50,112- 87-192-C- -
W6PQT 48,705- 85-191-C-15
W6BJU 39,780- 85-156-C-49
W6ETJ 14,892- 51- 99-B-40
W6UYW 11,592- 46- 84-C-25
W6HJ 10,707- 43- 83-B-27
W6AX 7800- 40- 65-B-16
W6BUD 7503- 41- 61-C-12
W6AKI 5445- 33- 56-C-27
W6EZJ 4284- 28- 51-B-65
W6VBI 4107- 37- 37-A-42
W6WPI 3234- 22- 49-B-15
W6GEB 649- 11- 21-A-10
W6ZOL 420- 10- 14-A- 6
W6JQB 72- 4- 6-B- 4
W6DQZ 48- 4- 4-C- -
W6OEG (W6s ENV ITA) 411,000-250-548-C-90
W6GAL (W6GHU) 278,098-211-440-C-88
W6BPD (W6TSW) 263,268-206-426-C-96
W6HX (3 Operators) 257,070-209-410-C- -
W6CUQ (W6s BXL GFF) 165,831-167-331-C-75
W6AM (W2SO W6LEE) 159,264-168-317-C-48
W6FSJ (W6BUD) 145,545-155-313-C-40
W6UCX (W6WWQ KH6NB) 101,470-139-244-C-81
W6RVX (W6APH) 37,740- 85-148-C-48

Arizona

W7NDQ 2205- 21- 35-B-12
W7PZ 756- 14- 18-B- 5

San Diego

W6ITY 181,440-180-336-C-85
W6EPZ 148,950-150-331-C-79
W6BAM 81,270-126-215-C-60
W6LRU 56,736- 96-197-A-56
W6GTM 39,591- 83-159-C-55
W6CHV 28,182- 77-122-B-55
W6KBD 27,477- 71-129-B-41
W6CAE 12,936- 44- 98-C-31
W6MI 4800- 32- 50-A-16

WEST GULF DIVISION

Northern Texas

W5ENE 202,584-184-367-C-69
W5GSE 8140- 37- 74-B-39
W5BNO 3960- 30- 44-B-12
W5OLG 2622- 23- 38-A-23
W5FKQ 1380- 20- 23- - -

Oklahoma

W5EGA 32,319- 81-133-B-50
W5LW 22,680- 60-126-B-30
W5JSB 17,052- 58- 98-B-46
W5LJI 11352- 44- 86-B-28

Southern Texas

W5JC 19,596- 71- 92-C-35
W5DAA 16,245- 57- 95-B-38
W5FXN 8364- 41- 68-C-32
W5OPP 5576- 34- 56-B-40
W5BDI 3700- 25- 50-C-28
W5HDS 3240- 24- 45-C-26
W5PM 2592- 24- 36-B- 7
W5IHJ 1596- 19- 28-A-11
W5OZI 561- 11- 17-B-13
W5ACL 270- 9- 10-C- 4
W5LVD (W5LGG) 212,931-177-401-C-87

New Mexico

W5LGS 28,968- 71-136-B-45
W5PVM 9072- 42- 74-B-51

CANADA

Maritime

VE1PQ 64,980- 95-228-B-55
VE1IM 36,267- 77-157-A-61
VE1CU 30,240- 70-144-B-46
VE1DB 2926- 22- 45-B-25
VE1SW 2520- 20- 42-B-10

Ontario

VE3KE 111,262-143-278-B-55
VE3IJ 52,461- 87-201-B-40
VE3AGX 31,104- 72-144-B-50
VE3ZW 30,825- 75-137-B-34
VE3BYJ 23,485- 61-131-B-37
VE3DT 21,045- 61-115-B-33
VE3QU 16,878- 58- 97-B-35
VE3SR 15,892- 58- 92-B-28
VE3HG 5760- 40- 48-A-18
VE3AJU 5040- 30- 56-B- -
VE3BBY 3240- 30- 36-B- -
VE3VD 1458- 18- 27-B-13
VE3ACB 243- 9- 9-B-4
VE3GI 126- 6- 7-B-2

Quebec

VE2WW 153,546-163-315-B-59
VE2BV 78,225-105-249-B-60
VE2BK 8,850-107-184-B-35
VE2FG 14,382- 51- 94-B-42
VE2AIE 3275- 25- 45-A-24

Alberta

VE6AO 22,446- 58-129-B-26
VE6MZ 3726- 27- 46-B- -

British Columbia

VE7VO 220,248-184-399-C-42
VE7ZM 122,310-135-302-B-51
VE7KC 15,141- 49-103-B- -
VE7FC 4700- 25- 53-C-21
VE7AIT 1440- 15- 32-B-10

Manitoba

VE4RO 212,352-168-422-C-76
VE4TJ 7200- 40- 60-A-40
VE4MF 180- 6- 10-B- -

Saskatchewan

VE5QZ 42,588- 78-182-A-45
VE5PK 6882- 37- 62-A-14
VE5JV 5775- 33- 59-B- -
VE5GF 1887- 17- 39-B-16
VE5UN 1428- 17- 28-A- -

Yukon

VE8AY 12,015- 45- 89-B-33
VE8FW 11,894- 38-107-A-27
VE8AS 8544- 32- 89-C-30

Labrador

VO6EP 2184- 21- 36-B- -

AFRICA

Algeria

FA8BG 233 280-60-1296- - -64
FA8IH 186,447-57-1097-A- -
FA9RZ 93,300-50- 622-A- -
FA8CR 50,526-42- 401-A-45
FA8DA 8664-19- 152-A- -

French Cameroons

FE8AB 51,170-34- 502-A- -

French Morocco

CN8AG 4068-12- 113- - -

Tangier

EK1AO 242,394-71-1149-B-80

Tunisia

3V8AB 37,665-27- 465-A-43

Union of South Africa

ZS5YF 177,408-56-1056-A- -
ZS6CT 129,774-43-1006-A- -
ZS1FD 34,716-33- 356-A-21
ZS1M 23,008-32- 241-A- -

ASIA

Aden

VS9AA 234- 6- 13-A- -

Israel

4X4CR 8806-14- 211-A- -
4X4BX 2484-12- 70-A-24

Japan

JA2CK 159,432-52-1022-A-53
JA2FM 52,904-34- 522-A-47
JA2RO 9450-15- 210-B-18
JA2AI 2241- 9- 84-C-12

Korea

HL1BJ 14,326-26- 185-C- 9

Okinawa

KR6CG 13,125-25- 176-C-26
KR6CI 11,676-21- 186-C-18

Saudi Arabia

HZ1HZ 3915-15- 88-B-15

Singapore

VS1DZ 23,600-25- 315-A- -

Turkey

TA3FAS 7922-17- 157- - -

EUROPE

Austria

OE1CD 54,094-43- 420-A- -
OE6AA 405- 9- 15-A- 4

Belgium

ON4QF 279,272-56-1673-A- -
ON4DB 161,700-55- 984-A- -
ON4GU 55,632-38- 490-A-58

Channel Islands

GC4LJ 43,932-36- 379-A-40
GC2BMU 13,025-25- 175-A-15

Corsica

F9QV 21,816-24- 303-A- -

Czechoslovakia

OK1FF 262,200-60-1498-A-83
OK1RW 111,384-52- 717-A-69
OK1MB 96,950-50- 658-A-80
OK2SO 85,557-57- 506-A-58
OK2MV 60,030-45- 457-A-47
OK1VW 35,668-37- 324-A-18
OK2EL 17,792-32- 188-A-49
OK1DL 5024-16- 106-A-21
OK1CX 3900-20- 66-A-14
OK1BM 3750-15- 85-A-15
OK2DD 3476-22- 54-A-12
OK2MA 3339-21- 54-A-10
OK1VB 2691-13- 69-A-14
OK1NA 1352-13- 36-A-14
OK2TZ 1170-10- 39-A-14
OK1ZM 880-11- 27-A- -
OK1OBC 640- 8- 27-A- 1
OK1NS 232- 8- 10-A- 2
OK2UD 182- 7- 9-A- 2
OK1DC 126- 6- 7-A- -
OK1JX 3- 1- 1-A- 1

Denmark

OZ3FL 152,481-53- 976-A-89
OZ7G 127,466-46- 932-A-74
OZ1W 124,709-53- 795-A-88
OZ7BG 57,405-43- 447-A-27
OZ7EU 23,870-31- 261-A- -
OZ7X 21,624-34- 215-A- -
OZ1H 17,970-30- 201-A-27
OZ4LM 406- 7- 20-A- -

Eire

EI9J 248,640-60-1384-B-58
EI5F 66,261-39- 568-B-58
EI8D 8775-25- 117- - -14

England

G4CP 135,936-59- 769-B-73
G3SU 113,457-59- 646-B-80
G2MI 100,550-50- 671-B- -
G3DCU 96,280-58- 558-B-62
G2VD 69,700-50- 472-B-66
G6RB 55,762-49- 380-B-60
G8IP 51,729-43- 403-B-50
G2QT 36,828-44- 279-B-45
G5FA 24,860-40- 209-B-35
G5WI 16,128-28- 192-B-60
G2AJB 2108-17- 42-B-12
G6NK 1296-12- 37-A-22

Finland

OH6NR 39,672-38- 351-A- -
OH8NV 19,725-25- 264-A-34
OH2PK 7371-21- 117-A-27
OH3NY 6174-18- 115-A- -
OH3NJ 36- 3- 4-A- -

France

F9BO 133,812-54- 831-A-51
F8VJ 63,600-50- 428-A-41
F3MS 47,012-46- 343-A-36
F8AT 37,135-35- 355-A-41
F8TM 34,155-45- 253-A-30
F8TQ 25,690-35- 251-A- -
F9QN 16,125-25- 215-A- -
F9PQ 13,944-28- 166-A- -
F8WK 12,818-26- 165-A- 9
F9ND 5860-20- 101-A- -
F9BB 1908-12- 53-A- 6
F9RS 820-10- 29-A- -
F3TJ 756-12- 21-A- -
F8LD 720-12- 20-A- -
F9IL 470-10- 16-A- -
F9NG 336- 7- 16-A- -
F3HK 210- 7- 10-A- -
F8MR 85- 5- 6-A- -
F8GQ 27- 3- 3-A- -

Germany

DL1DX 162,525-55- 985-B-74
DL1ED 159,258-57- 946-B-83
DL1FF 143,013-57- 839-B-76
DL1VR 96,089-49- 656-A-52
DL4LN 83,049-47- 592-B-39
DL1KB 80,550-50- 537-B-54
DL1FK 64,656-48- 455-B- -
DL1DA 42,661-37- 385-A-30
DL1JF 23,500-38- 209-B-32
DL4FA 14,058-22- 216-B-29
DL1XF 4672-16- 99-A- -
DL1GY 3666-13- 94-A-13
DL1QT 1008-12- 28-A- 8
DL1GD 990-11- 30-B-15
DL1YA 456- 8- 19-A-10

Greece

SVØWH 22,260-28- 268-B- -

Hungary

HA4SA 59,829-37- 555-B-90

Iceland

TF3EA 83,162-43- 645-B- -
TF3SF 65,844-36- 615-A- -
TF3MB 29,160-30- 330-A- -
TF3AB 19,656-21- 312-A- -

Italy

I1PL 129,536-46- 940-A-59
I1ALU 108,900-44- 832-A- -
I1PQ 23,310-30- 263-A-28
I1KE 9513-21- 151-A-33
I1ER 1241-17- 26-A-22

Luxembourg

LX1JW 54,943-47- 399-B- -

Madeira Island

CT3AV 15,352-19- 270-A-11
CT3AB 11,904-31- 128-A- 9
CT3AA 5952-12- 169-B-14

Netherlands

PAØEP 166,760-55-1021-A-85
PAØLZ 121,800-50- 832-A- -
PAØWJ 116,532-52- 748-A-57
PAØOK 54,325-41- 447-A-48
PAØDA 33,264-44- 252-A-27
PAØJX 27,664-38- 245-A-40
PAØDV 3192-14- 76-A-11
PAØNW 3120-16- 66-A-68
PAØZL 2856-17- 56-A-30
PAØKM 1236-12- 35-A- 7
PAØRZ 534- 6- 30-A- 6
PAØPZW 162- 6- 9-A- 3

Northern Ireland

GI2FHN 44,505-43- 353-B-43
GI6YM (GI3AXI GI6ITK) 70,453-47- 503-B-34

Norway

LA7Y 200,940-68- 997-A-80
LA6U 79,728-44- 609-A- -
LA6PB 43,470-46- 315-A-42
LA8J 9534-14- 231-A- -
LA9T 2370-15- 54-A-11
LA4K 1683-11- 51-A- 6

Portugal

CT1SQ 54,585-45- 406-B-32
CT1AL 1683-11- 52-A- 3

Roumania

YO3GK 21,120-30- 239-A-21
YO3RF 15,990-26- 210-A-23

(Continued on page 104)

Correspondence From Members-

The Publishers of *QST* assume no responsibility for statements made herein by correspondents.

AMATEUR OPERATING

108 Sias Ave., Newport, Vt.

Editor, *QST*:

After an experience last night, I appreciate much more than on first reading the article "Basic Operating Procedure" in July *QST*.

I had a message from New York City and as I couldn't make the local net I thought I'd try raising New York City on 80 meters. After about 15 minutes of calling CQ NYC and signing KN — with listening breaks — I was happy to hear a W2 calling me. Greetings and signal reports were exchanged, my RST being 589x. Then I was asked if I said I had a message for N.Y.C., "the QRM bad here and not sure what you said." After a 589x report! I replied I had a message. Then the pay-off: "I'm sorry, OM, but can't handle your message as I have to get to bed."!

So back to CQ NYC with a W1, VE2, VE3, W8, and W9 calling me. I was beginning to wonder if I shouldn't just call CQ and sign K. Hi! Finally a W2 called in. After establishing contact, his offer to help was accepted and my tfc and tnx went to him.

I sure hope that more will read the article *and apply it* to their daily operating.

— *Bob Scott, W1RNA*

COULD BE!

27 Wine St., Atlantic City, N. J.

Editor, *QST*:

"Fine Business" on the article in July *QST* by Goodman. I'm just wondering how many hams are writing in to know if the story about "The Loneliest Ham in the World" is true. I enjoyed the article, but anyone who would actually believe such a load of blarney must be nuts!

Oh, yes — by the way — is it *actually* true? If so, I'd appreciate some info on that antenna system!

— *Jim Casto, W2YSP*

S.S.B.

Glen Cove, N. Y.

Editor, *QST*:

I have been on s.s.b. for about three months, and find that in that time I have realized more operating pleasure than at any time in my amateur career. . . . I use a voice-control system of my own design that makes for wonderful two-way work with others similarly equipped.

In case some think that one must be an engineer to have the know-how to build and operate a s.s.b. rig, I should like to state that I am 17 years old and will be a senior at Glen Cove High School. My father is not a ham or an engineer. I became interested in s.s.b., built up a rig, and that is all there is to it. I guess the reason that most of the s.s.b. boys are engineers is that they realize fully the advantages of s.s.b. which the average ham does not.

— *L. Dennis Shapiro, W2URX*

FAIR PLAY

P.O. Box 3093, Rochester 14, N. Y.

Editor, *QST*:

Some operators who do not raise a particular DX station after two or three calls have the bad habit of breaking out with a long CQ right on the frequency. For those of us whose work is almost entirely DX, and who have learned to wait patiently for a chance, such a practice in DX is not good operating technique and, to say the least, is poor sportsmanship. As I see it, either the CQ-er hopes to raise the DX with the CQ or assumes a "t' heck with you" attitude. In many cases the length of the call and the mad pounding of the key reveals that attitude.

Why not play the game right? Conditions may be wrong for one but right for the others, so to those whose ears get red not because of prolonged listening, I say: If you can't take it, move out, blow, scram, get lost somewhere!

— *Chas. I. Otero, W2UPH*

QSL BUREAUS

28-19 214th St., Bayside, L. I., N. Y.

Editor, *QST*:

I have just had a very interesting experience with one of our QSL bureaus. W2SN, H. W. Yahnel, is the station of which I write, and his very efficient way of taking care of QSLs entrusted to him.

It was two years before I woke up to the fact that possibly some of my long-overdue cards might be there.

My contact with W2SN resulted in eleven cards representing seven countries being forwarded to me. My amazement was furthered by noting the two-year-old dates.

Please pass along my sincere good wishes to ARRL QSL Bureau Manager W2SN.

— *H. Bryce White, W2YAN*

[Editor's Note: There is a QSL bureau in each of the W and VE call areas, all ready to send you any foreign QSL cards that may have come via the ARRL QSL Bureau system. All you have to do is to send *your* district QSL manager a stamped, self-addressed envelope which is 4¼ by 9½ inches in size. See page 32 of July *QST*. Please note that cards unclaimed for more than one year may have to be destroyed for lack of storage space.]

"FD" COVERS

64 Whitten St., Dorchester, Mass.

Editor, *QST*:

Wha hoppen? I awaited my issue of *QST* for July with baited breath and near fainting spells each time the mailman rang. Then lo and behold it arrived. Boy, was I disappointed! What happened to W1CJD's cover cartoon of the Podunk Valley Radio Club at the conclusion of Field Day? The suspense is killing me!

— *Walter E. Szuminski, W1ETW*

POLITICIANS WANTED

West Middletown, Ohio

Editor, *QST*:

As yet I have not been troubled with TVI but there are plenty who have. If the manufacturers would incorporate the right kind of filters in the receivers it would only increase the cost five or ten dollars per set and the public would buy just as many. Why should the amateur run over next door and install a filter in the lead-in of his neighbor's TV set and stand the expense himself when it should have been taken care of when the set was built? Let auto ignition or something else knock the picture off the screen of his set and he merely readjusts the darn thing and says nothing, but let him suspect one of us amateurs is doing it and he is ready to kill us.

The amateur in general is a very intelligent person and deserves more credit than he has been getting, simply because the public doesn't understand him. He usually is a harmless sort of a fellow who minds his own business and is in deep thought most of the time working out some kind of

(*Continued on page 106*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
JOHN E. CANN, W1RWS, Asst. Comm. Mgr., C.W.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator

J. A. MOSKEY, W1JMY, Deputy Comm. Mgr.
L. G. McCOY, W1ICP, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

Fall Activity Inviting. Whether you're interested in the National Traffic System and participation through your section net, or in DXCC, code-proficiency awards, contests, CD Parties, v.h.f., or your new mobile, the advent of the new season can be greeted with enthusiasm. ARRL offers the time-tested recognitions for your operating activity in the different lines of natural interest, and in addition, the customary major contests with their ability to increase individual pleasure and operating efficiency. With September we should be able to bid farewell to summer QRN and enjoy communications on all bands of amateur interest, working with better signal-noise ratios and crisp, clear signals for either casual QSOs or for the purposeful net operation that spells nationwide capabilities in handling communications.

It's too early to tell for sure whether this year's FD topped all previous records. A number of the reports were 10 to 20 per cent over those of the preceding year. This can be interpreted to forecast either improved FD organization and operating efficiency or an increase in the number of stations afield. Operating activity has its seasonal ups and downs and the emphasis changes to mobile and portable operations in summer. Here we are at the start of a new radio season — a clean page in the logbook on which to write new radio progress and accomplishments.

Suggestions for Bonus Credit for Mobile in FDs Requested. One of the greatest Field Days in ARRL history is now a memory. Along with the reports of successful results are some ideas for the '51 FD. There seems considerable point in having a bonus of some kind for club work with a club's *own* mobiles or other mobiles in the locality. Ten points might be added after multiplier, for contact with each mobile at distances over, say, $\frac{1}{4}$ mile. Units could deploy as they might in actual emergency, might report by message to the Class A set-up of portables. All other FD work would be as usual. Chief significance is the idea, that any club testing with one or more Field Day mobiles of its group has a tested, operative nucleus for emergency communications. This would mean realistic preparedness, if and when we have more Vanports, Texas Citys, and South Amboys!

Let us know if you support the principle of making this a more direct emergency exercise in the course of future FDs that keep all the regular factors, please. Such score component for the Class A club-portable entry would of course be limited to a fixed amount. Alternative suggestions and comment will be appreciated to add meaning to our '51 Field Day. This is to solicit any further ideas.

One Strong Facility. Geographically our potential in emergencies is that of the number of active licensees! Analysis of the Simulated Emergency Test results focuses attention on our local and regional capabilities for rendering emergency communications. Actually what we can do depends on individual operator-and-equipment readiness. Are *you*, as an individual, identified with *organized* emergency work? *The ARRL Emergency Coördinator* has the prime duty of centralizing amateur effort, serving on communications committees where invited by the Red Cross. He has the duty of familiarizing different agencies that will need communication with the channels to insure that necessary 'phone calls for assistance come his way. You as an individual operator have the chance to serve best, the opportunity to get *your* share of the jobs to be done (as there are messages to be placed), if you are lined up with him in advance. Our effectives, dedicated to and practised by tests in handling communications, are not so numerous as to permit too many to assist particular agencies to the exclusion of everything else in an emergency.

AEC WAY
TOWER WAY
HAPHAZARD WAY (DEAD END)
EVERYWHICH WAY
ONE STRONG FACILITY FOR HAM SERVICE TO ALL AGENCIES IN THE PUBLIC INTEREST
THE CROSSROADS

We depend on operating as one strong facility; the priority for each assignment depends on the degree of public interest or necessity in it. So we urge: Join the ARRL Emergency Corps. Contact your Emergency Coördinator. Hold an AEC card, Full or Supporting group. Build on this principle of the *one well-organized facility*. Make it *strong* through your support and identity with it.

Got Your Mobile Unit Card? Several times this past season we have had occasion to emphasize the importance of *mobiles* in disaster service rôles. Texas City, Vanport, and South Amboy pointed up the desirability of every ARRL Emergency Corps group having an adequate number of mobiles to deploy quickly to strategic points for any emergency communication need. Emergency coördinators are now authorized to issue any licensee of an amateur station who holds the regular currently-endorsed Emergency Corps registration-identification card a Mobile Unit card on tinted stock, provided he can demonstrate in operation a workable mobile unit to tie in with fixed-station amateur facilities.

Another assist for AEC members is available through emergency coördinators. Designed to be as versatile as the press card used by reporters, Emergency Radio Unit identification strips on white cardboard will be issued to use on appropriate amateur equipment, or on cars containing either portable or mobile emergency installations, during simulated tests or actual emergencies.

Any and every radio amateur who is active should become a Full or Supporting member by registering in the AEC. Upon registration ask your emergency coördinator for the Emergency Radio Unit identification or the Mobile Unit card if you have a real emergency-powered portable — or a mobile equipment in operation.

Net Data Requested of NCSs. As explained under Traffic Topics, net registration cards are going out to all nets registered last season, and every NCS of a 'phone or c.w. net, whether previously registered or not, is requested to send this form (or postcard or radiogram if you haven't such a form) reporting data, frequency, and time of resuming (or new) fall net schedules. This is to assure a correct listing in the Net Directory now being compiled. This is all by way of providing League coördination and correlation of information to create and help maintain national integration of our provisions for traffic exchange.

September Frequency Measuring Test. Give each of the fall activities a whirl. Increase your skills. Aim to hold Code Proficiency and other League awards, and at least one appointment for operating activity. Try your hand in the September Frequency Measuring Test announced elsewhere in these columns. Don't miss the fall (Sept. 2nd–3rd) V.H.F. Party. Follow the ARRL Activities Calendar each month and note the special announcements as they come up. Drop a line to the SCM about the CD appointment you're qualified to hold. — *F.E.H.*

♦

Ray Woodward, W1VW, has been for many years an outstanding official observer and consistently a leader in the ARRL Frequency Measuring Tests. The rack at the left of the HQ-120, shown in this shot of his operating position, contains a continuously-running temperature-controlled secondary frequency standard, harmonic amplifier, and an interpolation oscillator that reads directly in cycles.

A.R.R.L. ACTIVITIES CALENDAR

Sept. 9th: CP Qualifying Run — W6OWP
Sept. 20th: CP Qualifying Run — W1AW, WØTQD
Sept. 21st: Frequency Measuring Test
Sept. 23rd–24th: V.H.F. Contest
Oct. 8th: CP Qualifying Run — W6OWP
Oct. 14th: Simulated Emergency Test
Oct. 17th: CP Qualifying Run — W1AW, WØTQD
Oct. 21st–22nd: CD QSO Party (c.w.)
Oct. 28th–29th: CD QSO Party ('phone)
Nov. 4th: CP Qualifying Run — W6OWP
Nov. 16th: CP Qualifying Run — W1AW, WØTQD
Nov. 18th–19th, 25th–26th: Sweepstakes Contest
Dec. 2nd: CP Qualifying Run — W6OWP
Dec. 18th: CP Qualifying Run — W1AW, WØTQD

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW/WØTQD will be made on September 20th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters. Frequencies of transmission from W1AW will be 1887, 3555, 7215, 14,100, 28,060, 52,000 and 146,000 kc. WØTQD will transmit on 3534 kc. The next qualifying run *from W6OWP only* will be transmitted on September 9th at 2100 PST on 3590 and 7248 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the five speeds transmitted, 15 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening, Monday through Friday, at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy.

Date	Subject of Practice-Text from July *QST*
Sept. 6th:	*An Accessory for C.W. Reception*, p. 11
Sept. 8th:	*All-Driven Arrays*, p. 14
Sept. 9th:	Qualifying Run, 2100 PST, from W6OWP only
Sept. 12th:	*An All-Band Crystal-Controlled Exciter*, p. 18
Sept. 14th:	*Basic Operating Procedure*, p. 20
Sept. 18th:	*A New Country Calls CQ*, p. 25
Sept. 20th:	Qualifying Run, 2130 EST, W1AW, WØTQD
Sept. 22nd:	*Technical Topics*, p. 28
Sept. 26th:	*The Loneliest Ham in the World*, p. 30
Sept. 28th:	*More Effective Speech Amplification*, p. 50

TRAFFIC TOPICS

By the time you read this, many net managers whose nets were registered with us last year will be receiving new net registration cards for the 1950–51 season. We hope that you will return these cards promptly, or as soon as fall and winter net planning has crystallized. We have no way of covering nets not previously registered, or nets incompletely registered last year, except by requesting all traffic and emergency nets, especially those operating on 160, 80 and 40 meters, to register the details of their operation with us so that this information can be coördinated into our net directory card file for subsequent compilation of a cross-indexed net directory such as we had last year, and for complete up-to-date records of traffic and emergency net activity at this headquarters.

Whether or not your net has previously been registered, be sure that we have the latest dope on your net operation so that our records and the net directory will show the latest data. Here is the information we need, as provided for on our net registration card: (1) name of net; (2) net designation (as used on air, so it can be identified when heard); (3) net frequency; (4) days of operation; (5) times of starting and ending net sessions (be sure to indicate the time zone); (6) direct coverage (i.e., by stations who actually report into the net regularly); (7) starting date (if not continuous); (8) call of net manager; (9) name and call of person submitting the information.

Only nets who register after September 1st will be included in the net directory. If your net is still on summer schedule at that time, you can either delay your registration until the net adopts a "permanent" winter schedule, or register according to your summer schedule and correct your registration when the winter schedule goes into effect. It is planned to produce one complete net directory, about the first or middle of December. *QST* listings, necessarily less complete than the mimeographed directory, are planned for November (1950), January, March and May, 1951, *QST*s, and can be used to supplement and correct the mimeographed directory as required.

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Those traffickers participating in the National Traffic System will be interested to know that studies are in progress for the issuance of certificates to NTS members, including members of those section nets which are participating in the NTS by sending nightly representatives to their regional nets. The certificates planned are expected to be of three distinct types, one each for area, regional and section nets. Net managers will issue them to the regular members of their respective nets except through the SCM in the case of section NTS net certificates. Net certifications will be determined by the net manager in each case, under principles based on last season's experience and such requirements as outlined from this.

It is hoped that these certificates will be available for issue by the end of the year, and that they will provide both an inducement to new NTS members and a recognition for those already active. The NTS needs the active help of all traffickers. The certificate will not only make a good-looking piece of wallpaper, but will identify *you* as a part of a nationally-integrated system for handling traffic.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for June traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
KG6DI	2093	2587	0	1091	5771
W7CZY	55	904	882	39	1880
W3CUL	51	785	727	57	1620
W3GEG *	8	477	406	56	947
W4PL	7	443	410	38	898
WØZJO	32	403	367	36	838
W6CE	12	389	326	5	732
W6JZ	42	316	316	44	718
W6GAL/6	302	146	136	10	594
W6AYL	48	271	259	12	590
WØHMM *	0	257	254	3	514
W9EBX	5	248	242	6	501

The following made the BPL for 100 or more *origination-plus-deliveries:*

W6DTW 219	W7KCU 134	W8UKV 102
KG6FAA 207	K5NRJ 111	W6LDR 100
W4AQL 147	WØQXO 108	

W9DGA made BPL for May traffic with 52 deliveries.

A message total of 500 or more or 100 or more *origination-plus-deliveries* will put *you* in line for a place in the BPL. The Brass Pounders League is open to all operators who qualify for this monthly listing.

* May traffic.

FREQUENCY-MEASURING TEST, SEPTEMBER 21ST

All amateurs are invited to try their hand at frequency measuring. W1AW will transmit signals for the purpose of frequency measurement starting at 9:30 P.M. EST (6:30 P.M. PST), Thursday, September 21st. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3568, 7124 and 14,113 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:36 P.M. It is suggested that frequencies be measured *in the order listed.* Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 12:30 A.M. EST, September 22nd (9:30 P.M. PST, September 21st), W1AW will transmit a second series of signals for the Frequency-Measuring Test. Approximate frequencies used will be 3665, 7174 and 14,144 kc.

Individual reports on results will be sent to all amateurs who take part and submit results. Copies of this report are sent SCMs also, so eligibility for OO appointments is known. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between limits of 71.43 and 357.15 parts per million, the participants will become eligible for appointment by SCMs as Class I or Class II official observers, respectively.

This ARRL Frequency-Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers *not* demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required

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On the occasion of Alumni Day at Stevens Institute of Technology, W2BFD installed complete radiotele-type facilities on the veranda of the administration building and dispatched message traffic to W2QGH in Larchmont, from whence it was relayed by automatic reperforator directly into the shacks of long-haul traffic net members. The station call was that of the Stevens Radio Club, W2BSC/2, and was manned by members of that club. All traffic was sent by RTTY on 147.96, using only three hours of "on the air" time to handle several hundred messages. President Davis of Stevens Tech transmitted the first message, as shown in the picture which also includes, left to right, W2OTM, W2VVV, W2CKT, W2WXI, W2BFD.

accuracy for these classes of appointment. Class I and Class II OOs must participate in at least two Frequency-Measuring Tests each year to hold such appointments. SCMs (see address, page 6) are open for initial applications for Class III and IV observer posts, good receiving equipment for 'phone and c.w. bands being the main requirement. *All* observers must make use of the cooperative notice (mail) forms provided by ARRL, reporting activity monthly through SCMs, to warrant continued holding of official observer appointment.

QST To Report Results

Any amateur may submit frequency measurements on one or all frequencies listed above. No entry consisting of a single measurement will be considered eligible for the *QST* listing of the *top results* in this FMT; at least *two* readings and preferably more should be submitted to warrant *QST* mention. Order of listing will be based on the over-all *average* accuracy, as compared with readings submitted by an independent professional frequency-measuring organization.

MEET THE SCMs

Richard F. Czeikowitz, W6ATO, recently elected as SCM of San Francisco, received his first call back in 1926. An enthusiastic participant in ARRL contests, he was 1949 c.w. winner for the San Francisco section in both the DX Contest and the Sweepstakes. He is a past-president of the San Francisco Radio Club, is currently vice-president of

the Northern California DX Club, and also is a member of the Hi-Frequency & Mobile Society of San Francisco. SCM Czeikowitz holds DXCC, WAS, WAC, WBE, and BERTA certificates, postwar. At present he is working on a 'phone DXCC.

An entire room in his home is devoted to amateur radio. Equipment consists of a Collins 310-B3 exciter directly driving p.p. 4–250As to a kw. input on all bands. The transmitter is completely shielded, uses Faraday screening of output and vacuum-condenser by-passing to eliminate harmonics. All circuits are fully metered, including separate screen meters. Receivers are a Collins 75A-1 and an SX-28. Antennas are a 14-Mc. three-element and 28-Mc. three-element rotary on the same boom, a dipole on 7 Mc., and a short end-fed wire on 3.5 Mc. loaded by a BC-610 antenna-tuning unit. While W6ATO gets out well on 3.5, 7, 14, 27, and 28 Mc., the most-used band is 14 Mc.

Although a nonparticipant in sports now, he formerly played basketball and soccer, and was a sprinter, as well as playing the quarterback position on various small football teams.

SCM Czeikowitz is employed by the Western Pacific Railroad as chief clerk in the Telegraph Department.

W1AW OPERATING SCHEDULE

(Effective Sept. 1, 1950)

(All Times Given are Eastern Standard Time)

W1AW will change to its fall-winter operating schedule on September 1st, superseding the summer plan and previous announcements. Mimeographed master schedules showing complete W1AW operation in EST, CST, MST, PST or GCT will be sent to anyone upon request.

Operating-Visiting hours:

Monday through Friday: 1500–0300 (following day)
Saturday: 1900–0230 (Sunday)
Sunday: 1430–2200

W1AW will be closed from 2200 September 3rd to 1500 September 5th in observance of the Labor Day holiday.

General Operation: Use the chart below for determining times during which W1AW engages in general operation on various frequencies, 'phone or c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall in the evening of the previous day in western time zones. W1AW will participate in all official ARRL operating activities to the extent feasible, utilizing Friday general-operating periods for this as well as scheduled Sat.-Sun. time as practicable.

Official ARRL Bulletin Schedule. Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

Frequencies:

C.W. — 1887, 3555, 7215, 14,100, 28,060, 52,000, 146,000 kc.
'Phone — 1887, 3950, 14,280, 29,000, 52,000, 146,000 kc.

Times:

Sunday through Friday, 2000 by c.w., 2100 by 'phone.
Monday through Saturday, 2330 by 'phone, 2400 by c.w.

Code-Proficiency Program: Practice transmissions are made on the above-listed c.w. frequencies, starting at 2130, Monday through Friday. Speeds are 9, 12, 18, 25 and 35 w.p.m. on Monday, Wednesday and Friday, and 15, 20, 25, 30 and 35 w.p.m. on Tuesday and Thursday. Approximately ten minutes of practice is given at each speed. Next certificate qualifying run from W1AW and W@TQD is scheduled for Sept. 20th; from W6OWP, Sept. 9th.

W1AW GENERAL-CONTACT SCHEDULE

(Effective September 1, 1950)

W1AW welcomes calls from *any* amateur station. Starting September 1st, W1AW will listen for calls in accordance with the following time-frequency chart.

EST	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0020–0100 *	.....	.....	3555	7215	3555	7215	3555
0100–0200	.....	.....	7215	3950	7215	3555	7215
0200–0300	.....	.....	3950	7215	3950	7215	3950
1500–1600	.....	28 Mc.**	14,100	14,280	14,100	28 Mc.**	.....
1600–1700	.....	14,280	28 Mc.**	14,100	28 Mc.**	28 Mc.**	.....
1700–1800	.....	.....	14,280	28 Mc.**	.....	14,280	.....
1930–2000	.....	14,100	14,280	14,100	14,280	14,100	.....
2020–2100 *	.....	3555	14,100	14,100	7215	14,100	.....
2110–2130 *	.....	14,280	51 Mc.	146 Mc.	14,280	14,280	.....
2230–2330	.....	7215	3950	1887	3555	1887	.....

* Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins on the hour.

** Operation will usually be conducted on 29,000-kc. 'phone, but 28,060-kc. c.w. will be used occasionally.

For many years the ARRL Emergency Corps has been dedicated to service to the public and to the nation in time of emergency. This purpose has been well carried out, and we have a long and proud history to show for our accomplishments and efforts. The emergency-mindedness of the amateur has increased, and with it the public consciousness of our existence and availability, so that civic, state and federal relief agencies and organizations are now working us into their emergency communications plans.

Thus it is that now, with a new and much more serious kind of emergency facing us, many local civilian defense agencies are turning to their amateur contingents, among others, to plan for the ultimate; and said amateur contingents are anxiously asking us the answer to the question: "In the event of enemy attack or war, what frequencies will be available for use of the ARRL Emergency Corps to assist in providing supplementary or parallel civilian defense communication facilities?"

We cannot answer that question, fellows — not at this writing, anyway. In time of war, the military is responsible for national security. We can bank on it that casual amateur communication will be silenced, but to what extent amateurs will be reactivated to work into civilian defense plans is still to be worked out. Studies on all such matters are being made in Washington, and your League is maintaining the closest contacts with officials concerned with communications. The ultimate shape and size of the communications plan, and the extent to which amateurs, *as* amateurs or as participants of another service, will be utilized is still conjectural. It must be realized that civilian defense is now a much more complicated and widespread problem than it was in World War II. Plans will be forthcoming, and amateurs will be included in them. But we cannot yet indicate the frequencies which will be utilized.

Meanwhile, this is no time to let our AEC organizations slide downhill. Admittedly, it is impossible to make definite plans locally until definite plans are made nationally — that is, as far as equipment is concerned. But there is still plenty of reason for conducting tests, drills, simulated emergency workouts, etc., now more than ever before with emphasis on efficiency and discipline. Emergency communication has always been a serious business, but now it becomes infinitely more serious. Speed up, not slow down, is the watchword. If we now demonstrate that we are capable of much, we will stand a much better chance of being included in ultimate plans with the fewest changes.

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Got your "Official Mobile Unit" card? If you are the owner of a mobile rig and are registered with your local EC, you are eligible for a tinted card (similar to the regular AEC membership card) bearing the designation "Official Mobile Unit." You are also eligible for a placard bearing the inscription "EMERGENCY RADIO UNIT" in large black letters, for display on your mobile unit or inside your car windshield. The latter is also available to amateurs registered with the AEC who have built composite units for use in emergency work, at the discretion of the EC.

Your EC is authorized to issue this material to deserving members of his local organization, in addition to the regular AEC registration card. The "Official Mobile Unit" card must be endorsed once each year to preserve its validity. See your EC for details.

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Last year during Field Day, many West Virginia amateurs who were preparing to participate found themselves involved in the real thing — a flash flood in Petersburg. This year, believe it or not, the same thing happened. The exact locale changed slightly, but aside from that we could almost rerun last year's write-up of the affair.

An unprecedented deluge began about 8:30 P.M. on Saturday, June 24th, and continued on through the night. The waters of tiny Middle Island Creek and the Monongahela River and countless other small streams plunged outside their banks, sweeping all before them. Hardest hit were the towns of Smithburg, Cairo, Weston, West Union, and Berea. At least seventeen people were counted dead after the first day.

W4NKG, who is a staff writer for a Charleston, W. Va., paper got in touch with W8PQQ, who contacted Bill Dixon of the Kanawha Valley Amateur Radio Association, and the entire amateur contingent in Charleston and surrounding areas including the Charleston Amateur Radio Club was alerted for emergency duty. W8AUJ was active in hard-hit Weston and was able to portray the extent of the damage by radio. Brig. Gen. Charles R. Fox, adjutant general of West Virginia, sent relief as a result of the message by amateur radio. W8KWI of Clarksburg moved his mobile unit into the West Union area and the Mountaineer Amateur Radio Club of Fairmount had set up in the Smithburg area and handled the major part of the emergency traffic that could not be handled by regular communication lines.

Brig. Gen. Fox, in a statement to the Charleston *Gazette*, said, "The work of the amateur radio operators was magnificent in this disaster. Relieving much of the overloaded communication system, they performed a great service to the state." Unusually favorable publicity was also received. Among the other operators who participated were W8BTV, W8BWI, W8CNF, and W8GBF. Thanks to W4NKG for the report.

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AEC members in Muskingum County, Ohio, were given a chance to show their stuff in early June when a deluge struck the vicinity of Roseville and caused severe communication and power outages. W8DVH, the Muskingum County EC, was called at about 1:15 A.M., Saturday, June 10th, by a friend who asked if the water at Roseville was up to his parents' house yet. This was DVH's first intimation of trouble. He immediately called W8LQB, Zanesville's assistant EC, and in a few minutes they had decided which disaster plan to use. They picked up W8AZR, and from his mobile unit alerted W8INS to man the control station in Zanesville while they took off for Roseville. They had not yet reached Roseville when a general power failure occurred in Zanesville and the control station went off the air for a short time until emergency power could be hooked up. Arriving in Roseville, they made contact with W8ZYW, another mobile operator on his way down, and had him park up on a hill near Roseville to relay to Zanesville. About 7:00 A.M. W8YOM was able to get his mobile into Crooksville, about three miles farther south, after having had to use devious routes to get into town.

The execution of the prepared disaster plan resulted in 78 messages being handled for the Red Cross, the Ohio Fuel Co., The Ohio Bell Telephone Co., the Ohio Power Co., and a few others with priority traffic. The Zanesville Red Cross was so impressed that they wrote a letter to FCC in appreciation of the hams' fine work. The Muskingum County AEC was ready to do a job and they did it.

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On the evening of July 8th, 13½ inches of rain fell in parts of southeastern Nebraska. The result — floods! York and Beaver Crossing were particularly affected. Shortly after midnight Sunday morning (July 9th), WØEUT, Nebraska SEC, was called by the local radio station and asked if he could get in touch with York. At a time when most sane people are in bed, EUT expressed some doubt of his ability to do so, but nevertheless went on the air to try. Several general calls to the Nebraska gang were fruitless, although WØPCY in Kansas City and WØLJU of Denver offered assistance, the latter indicating that he could perhaps make contact via the police system. Meanwhile, EUT received a call from the York newspaper indicating that the lines from York to Omaha were still intact but that York was isolated from surrounding towns, and that help was needed. They were advised to call WØRWV at Giltner, who had a mobile rig. EUT then called WØOZC at Dwight, but got no answer. He then called WØLEF at Brainard, who agreed to go to York immediately and set up a transmitter.

By 4:00 A.M., things started rolling. WØPCY broke in on the Nebraska net frequency (3983) to tell WØEUT that WØRWV/mobile was calling him. RWV was near York and wanted instructions. He was instructed to proceed to the fire barn and assist WØLEF as soon as the latter arrived; this location, although taking some water, had been chosen as headquarters by the city. WØLJU at Denver relayed traffic to Lincoln via the police net. WØHQQ was requested to get on the air and stand by. WØWVE/mobile broke in and said he would call in when he got home.

About 5:00 A.M., WØLEF/Ø came on the air with WØRWV at the microphone, who said that WØLEF himself was at the airport installing a transmitter in a plane. A transmitter was also being installed in a National Guard "duck." WØBXJ came on the air and got the Lincoln gang coördinated, and there were quite a few of them active by that time. WØOAO volunteered to fly equipment to the scene, if needed. Wøs LTE, JDJ, HQQ and EDI were all standing by awaiting instructions. WØLTE was dispatched to Crete to assist WØFLA who was operating from his home. WØHQQ was dispatched to Beaver Crossing, where he was able to relay information and reports to the firebarn station, WØLEF/Ø. WØEDI and WØJDI went to Milford and thence to Beaver Crossing to assist WØHQQ. WØOAO was soon heard on the air *in* the air radioing reports back to York. WØYMU offered assistance and was assigned to assist at York as needed. He and WØZNI arrived at York about 10:30 A.M. and installed a BC-654 in a "duck," where it was used to radio reports and information back to headquarters. WØGTC acted as part-time control station for the Nebraska net, and handled some inquiry traffic to and from York.

It was a wonderful display of coöperation and every one of the gang did an excellent job. Losing sleep, taking the risk of getting bogged down in floodwaters, everybody nevertheless stuck to the job until there was no further need for their services. Other amateurs assisting were Wøs GYM, QOU, BIA, HS, EDI, LTE, YUF.

— *WØEUT, PAM Nebr.*

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Smart little Sam was quite a ham;
He had a kilowatt to work every band.
Smug and complacent, he thought he was "it,"
Until the time that the big storm hit,
And all the town victims of TVI
Thought "Now is the time he can help you and I."
But sad to relate, at this critical hour,
Sam did not have emergency power.
They said, "Sorry we bothered you.
We better go call on lo-power Stew."
With satisfaction as his only pay,
Stew got through to save the day.
Said he, in answer to the flattery,
"I did it all with my little old battery."
So they erected a statue on City Hall Tower
To good old Stew and his emergency power.

W3LJQ in "Hamateur News"

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On February 8th, VP5BF on South Caicos Island was heard attempting to contact a W4 with information that the SS *Marblehead* was on fire at South Caicos and needed assistance. W2QHH heard the call on 14-Mc. c.w. and, since VP5BF was apparently not getting any answers, informed KP4QZ of the message. KP4QZ then called the Coast Guard to get some action started toward relief. Meanwhile, W2QHH remained on the air to maintain contact with VP5BF, who seemed to be skipping over nearer points. Later on, conditions changed so that VP5BF and KP4QZ were able to communicate direct, and W4IKC, W4OPG and KP4KF also came on to assist in relaying information where needed. The owner of the vessel was notified and he arranged to dispatch a plane to the crew of the boat, who were stranded. This information was passed from W4IKC to W4OPG to VP5BF.

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Canadian and American amateurs assisted in maintaining communications during a raging fire which swept the mill town of Cabano, Quebec. VE2TC, operating mobile just outside Cabano, and VE2VR, activated a network which stretched from 90 miles east of Montreal to Presque Isle, Maine, and was instrumental in acquiring the aid of the Red Cross and the Army. Riviere du Loup was represented by VE2ABC, Charlesbourg by VE2ZL, Rimouski by VE2FI and Yamachiche by VE2XO. W1CNH was on deck in Presque Isle. All handled important official and personal-inquiry messages. When power failed in Cabano, W1CNH offered his good offices to get some power through from Presque Isle. This offer was accepted and within a short time several of the towns and villages surrounding Cabano had power, as well as a portion of Cabano itself. They are still trying to figure out how he did it.

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On the rear cover of the booklet "Emergency Communications" there is a box which contains some basic rules on what to do before, during and after emergencies. We are glad to be able to say that the AEC in recent months has made great strides in observing the "before" and "during" axioms, but sometimes we do not do so well on the "after" part of it, whether out of modesty or laziness we don't know. We submit that the matter of reporting your work, either to your EC, SEC, or SCM for consolidation, or direct to Headquarters, is *almost* as important as the doing of the job itself. Even if you think that what you did is "nothing," let the person consolidating the report be the judge of that, and remember that although a report of your activities in an emergency may reflect embarrassing credit on modest little you, it will also reflect credit on the public-service record of amateur radio. Report your emergency work!

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH	235	W2BXA	224	WØYXO	217
W6YFR	225	W3BES	223	W6MEK	216
G2PL	225	W6EBG	222	W9KOK	216
W8HGW	225	W6ENV	221		

RADIOTELEPHONE

W1FH	194	VQ4ERR	174	W1JCX	168
XE1AC	184	W8HGW	173	W9RBI	168
W6DI	181	LU6AJ	171	PY2CK	168
		W2BXA	169		

From June 15 to July 15, 1950, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued to the amateurs listed below.

NEW MEMBERS

LU7CD	144	W6ZBY	104	W2TNA	101
VK5RX	114	W8CED	104	OZ1W	101
WØSRX	110	G3COJ	103	W6UJ	101
W6UYX	110	MD5KW	103	W8WSL	101
GI4RY	109	W6JWL	103	W1COM	100
W8ACE	107	G2FYT	103	G3BNE	100
G2CBA	106	W4NNH	102	W9HUZ	100
WØDST	106	VK2YC	102	W4IZR	100
VE7KC	105	I1IZ	102	W9JNB	100
ON4JD	105	G3HK	102	VE7CN	100
W4DYM	105	W8PXT	102		

RADIOTELEPHONE

YK1AC	111	IS1AYN	104	VE3EQP	101
ZS1DO	107	YS2AG	103	CT1NT	100
W6UYX	105	WØUQD	103	W5ERY	100
G6TA	104	I1AUH	102	VK2DI	100
		W6SHW	102		

ENDORSEMENTS

PY1AJ	201	VO6EP	170	G3DCU	136
W6GAL	200	W8UAS	170	LA6U	133
W1ENE	200	LA7Y	170	W4CYY	133
W6NNV	195	W1CLX	162	SM5WI	133
W6SYG	192	W2RDK	161	W6ATO	130
WØUOX	190	W8DMD	160	VQ2DH	130
CE3AG	190	VE3IJ	152	ZL4GA	130
VE3QD	190	KV4AA	152	W8MPW	127
WØPNQ	190	W6CIS	150	W6ID	127
W3EPV	189	ZS6BW	147	W6DE	126
W6PQT	183	W3ALX	142	VE3AAZ	125
W6UCX	181	W1AH	140	W8AJW	122
PY2CK	174	W7DET	140	W6EAY	122
HB9J	173	JA2KG	140	W1ODU	120
G8KP	173	PAØHF	140	W1NLM	113
G8IG	171	KH6CD	140	W2WC	113
W8WZ	170	W3CEW	140	VE3JV	111
KP4KD	170	W2ADP	140	WØQVZ	110
W5GEL	170	W7GBW	140	W7RT	110
W2IMU	170	W8EYE	137	W8NJC	110

RADIOTELEPHONE

W1MCW	160	W4MKB	130	W8AJW	114
HB9DS	155	W3BES	126	W9CZC	111
ZL1HY	151	HB9J	124	G2MI	111
G6RH	150	W8BIQ	120	W3DKT	110
HC2JR	141	HC2OT	120	W2ZVS	110
G6AY	136	G8KP	120		

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, Jerry Mathis, W3BES — The section is mourning the passing of one of our most active hams, 3BQ, ex-8BQ, former SCM and Alternate Director. New officers of the Delaware-Lehigh Amateur Club are 2PXU, pres.; 3MAC, vice-pres.; 3NF, vice-pres.; 3QBF, treas.; 3PYF, secy. CUL bemoans her "low" traffic total because of house-cleaning and Field Day. The Philadelphia Area Council of Radio Clubs is in high gear. The June meeting had representatives from eleven clubs. The bulk of the activity was reporting the Schuylkill scull races but the Boy Scout Jamboree and the July 4th Fairmount Park celebration were well handled. A 150-watt all-band transmitter with a 20-meter beam was installed at Valley Forge by BYB, UKI, NDZ, and BES, and was operated mostly on 14,250-kc. 'phone from July 2nd through 5th by NDZ, PSH, PDJ, and OSE. Much favorable publicity was received in the local papers. Four fixed and one mobile station, cooperating with the Red Cross, covered the Fairmount Park July 4th celebration. Two police stations and two field hospitals were serviced with communications. Those participating were QEZ, RFQ, QLI, PUP, BYB, EM, KFK, and BES. Led by PUP and DHM, the Frankford Radio Club put on a demonstration of erecting two 60-foot Trilon towers for the Field Day antennas. Such a deal demonstrates who likes to climb and who doesn't. Reports from all local clubs indicate that this Field Day was one of their poorest, conditions contributing largely to the failures. Activity reports for June hit an all-time low of three. Traffic: W3CUL 1620.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Eppa W. Darne, W3BWT — The Baltimore Amateur Radio Communications Society, Mobile Corps, is planning to make a series of short trips on Sundays and holidays for testing gear on short- and long-range communications. BARC's third annual hamfest is scheduled for August 13th at Triton Beach, Md. On the last regular meeting for the summer, June 19th, the annual election of officers was held. The Chesapeake Amateur Radio Club's meeting of June 6th featured a talk on "Applications of Hi-Fi and Narrow Band Audio" by Don Palmer. Speaker for the June 30th meeting was Leister Graffis, who spoke on, and demonstrated, "Magnetic Amplifiers." The Washington Radio Club's June meeting was held at PZA, the Red Cross National Headquarter's disaster station. Members attending brought along their licenses and operated PZA. The University of Maryland Amateur Radio Assn. recently elected the following officers for the 1950–1951 season: Howard S. Parks, pres.; OSQ, vice-pres.; T. C. Van Vranken, secy.; PJM, corr. secy.; ONP, treas. The membership is building a large transmitter for next season. The Club held its annual picnic June 11th at the waterfront home of OLD. Along with the festivities, music was furnished by the audio system set up by ICS and KDV. The PRVEN group continued its fine drills during June on 3.85 and 144 Mc. with attendance well above par. A combined 3.85- and 144-Mc. field operation is being planned for August. OFU is on 3.5 and 7 Mc. with 30 watts with new antenna, and has his 35-w.p.m. Code Proficiency certificate. NAP, who operated mobile, is now operating at home with a 60-watt rig. NMU has a new antenna. PXC has a Collins 310B-1 transmitter and HRO-7 receiver. He is rebuilding his speech amplifier and made a three-weeks trip to the Midwest during June. IZL has been appointed Official Phone Station. OJU gets out well on 50 Mc. QPN, located at Garrison, Md., is a new call. Bill is on 7 Mc. with 90 watts to a Zepp antenna. AKR received his MARS appointment. We are very sorry to hear that he recently lost his mother, who resided in New Mexico. PTZ has been working with "TXN" and doing considerable rebuilding around his shack. PRZ is on 14 Mc. and rid of his T.V.I. QCW is off the air, and out of the country on foreign assignment. FQZ assisted EIS in getting together a 14-Mc. 'phone rig and 144-Mc. beam for Field Day, and is building a new exciter. NNX has been working some swell DX with his mobile 28-Mc. rig. He recently handled a request from TI2TG, where five people stricken with rat fever urgently needed aureomycin. Phil secured the drug from University Hospital, air-mailed it to TI2TG, where it was used effectively, thus performing another fine service to the credit of amateur radio. GZH is on 3.5-, 7-, and 14-Mc. c.w. with his new 200-watt rig, which is now completely T.V.I.-proof. PYW has a new 829 final. AHQ has a cascade preamplifier on his 522 receiver. UF leads the section in traffic this month with an unusually high total for mid-summer. He has been doing an excellent job as summer NCS for the MDD Net. AKB is busy at new QTH in Takoma Park, Md. Traffic: W3UF 417, GZH 168, HH 44, LZM 35, OFU 30, CVE 20, NNX 20, BWT 7, PTZ 7, PZ 2.

SOUTHERN NEW JERSEY — SCM, Dr. Luther M. Mkitarian, W2ASG — ZVW is high traffic man this month. CJH gets many DX QSL cards without working DX! RFF is building a bigger rig. BAY is a sailor man for the summer. ZYX still is looking for DX on 144 Mc. YSP is in the market for a 10- to 160-meter rig. Well, gang, news is scarce this month because you who are reading this have failed to send in reports. Let us hear from you. Traffic: W2ZVW 273, ASG 13, ZI 4.

WESTERN NEW YORK — SCM, Harding A. Clark, W2PGT — SEC: SJV. Net Manager: RUF. The Syracuse Amateur Radio Club will operate a station under the call K2NYS at the New York State Fair in the Horticulture Building from September 2 to 9 on 3.5, 3.85, and 7 Mc. The gang is invited to drop in for a visit and do some operating. If you cannot attend the Fair, look for K2NYS on the air. All contacts will be acknowledged with a special QSL card. The Rochester Mobile Club has been organized, with mobile activities taking place on 29,600 kc. Anyone interested in joining is requested to contact SGJ by phone at Glenwood 3794W. VIQ graduated from Syracuse University and has moved to W3-Land. The Niagara-Mohawk Net is going strong each Saturday at 9:30 A.M. on 7160 kc. All employees are invited to call in. YRF wants to know how to find time to be on the air when he has a fractured elbow and the three jr. operators have measles. You got troubles? QHH is sporting 190 endorsement on his DXCC. New officers of the Rochester DX Association are QCP, chairman; BZN, asst. chairman; VTR, secy.-treas.; and QCF and SAW were elected to the Board.

WESTERN PENNSYLVANIA — SCM, Ernest J. Hlinsky, W3KWL — Field Day was well represented by the various clubs. Among those qualifying for credit are GJY/3, Beaver Falls; QZF/3, Altoona; and SOAJ, Mercer County Radio Assn. Others known to have been active are IYR/3, the ATA aggregation, the Steel City Amateur Radio Club, and I believe, the Fort Necessity Radio Club. The Mercer County RA fellows parked themselves a few miles from town on top of a 1160-foot hill and worked 144 Mc. Thanks to LBZ for the swell layout. ODU says he is QRL because of a 10-hour working day. AER reports that OWH is back on 14 Mc. after many years. The Fort Necessity Radio Club has received its ARRL charter. EBY and QKE are new members of the Horseshoe Radio Club. In the recent VE/W Contest KQD, LJQ, LIV, and POZ finished in that order. POZ, NIK, and PRO are heard on 7 Mc. gunning for DX. KWH comes through with a few like these: QMD has his p.p. 814 perking like a charm. NKM's 14-Mc. rock crusher is silent because of lack of space. ETD is sporting a new NC-183. AEV is handling traffic on 14-Mc. 'phone. 4AO, 4BCT, and 3UFP in Williamsport were worked by KWH on 144 Mc. recently. KYC and UHM are heard at times on 144 Mc. ETD is proud of his DXCC award with 101 countries. The ATA of Pittsburgh reports that GJY won the QSL contest with 170 cards. LFK and NUG finished second and third. Congratulations to the ATA and its outside help for the swell job done in the Speedboat Regatta. The reports were lengthy and interesting. Let me remind you who hold ARRL appointments and who have failed to make annual endorsements, that your SCM will start the fall activities by cleaning his inactive files of all delinquent and inactive stations. All I ask is that you make every effort to see that your certificate has received its proper endorsement by your SCM. Remember, fellows, your one obligation to yourself and your fellow amateurs is to live up to the promises you made when you applied for appointment. Be fair to yourself and to the office you hold. Traffic: (June) W3AER 16, KWL 5, IYR 1, (May) W3GEG 947.

CENTRAL DIVISION

ILLINOIS — SCM, Lloyd E. Hopkins, W9EVI — Activities have been hard hit by vacations and numerous summer interests, so this report will be short compared to

our usual one. From all reports Field Day turned out to be a success in the face of threatening weather. EVJ spent Field Day with the gang at DUA. RNM is a new OPS. APK worked with the SRRC during Field Day. BUK is carrying the torch as NCS for HLN for many weeks. BGN is on TXN and PAN with new 400-watter when time permits. YTV is QRL redecorating home. GDI received DXCC certificate. LNI wishes there never was such a thing as TVI. JMG acquired a Signal Shifter, and with changes in the rig now works complete break-in. BON is operating marine mobile on 14-Me. 'phone with 50 watts. KJ and YIX were heard on HLN recently. EBX is back as NCS for TXN and turns in a nice total. NN knocked off 127 DX stations in 29 days with new 14-Me. vertical. George Bailey spoke before the Hamfesters on June 9th. Traffic: (June) W9EBX 501, BGN 143, BUK 41, IVN 32, FKI 28, EVJ 22, APK 10, ZQT 8, DBO 7. (May) W9PEK 29.

INDIANA — SCM, W. E. Monigan, W9RE — DHJ works 144 Me. during the summer months, and suggests short-hand nets working into QIN. BKJ visited Colorado during vacation and had portable rig on 3.85 Me. GPO transferred to Michigan. BAX is chief operator at WEOA. NEC visited W6-Land with a 7-Me. portable. CVN bought a new car in which to put a mobile transmitter. NZZ made DXCC. KFX says TVI is licked. CTC lowered his beam to be replaced with a new one for 'phone and spent the summer operating portable in Michigan. New at Evansville is Charles McQuigg. KAH, FFH placed high in the competition for appointment to the Naval Academy. GHK moved to Bloomington; he works for RCA. A fine time was had by all who attended the Indiana Radio Club Council Picnic. EGV received a plaque as the outstanding amateur. Even the rain did not curb the enthusiasm of those present. KLR is new at Rensselaer and will be on mobile. INU reports KRJ is new at Gary. HOG is active on 420 Me. GZQ is working on the rig and hopes to be on 420 Me. soon. Traffic: (June) W9JXH 173, DGA 93, BKJ 91, YB 51, NZZ 16, QLW 16, TT 16, RE 14, K9WAA 11, W9DHJ 10, DOK 4. (May) W9DGA 225, TT 176, BKJ 159, QLW 100, NZZ 96, YB 95, RCB 10, RE 23, DOK 12, JTX 8, KTX 8.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — FXA is proud owner of a new SX-71. HDZ has a 50-ft. tower for 28-, 50-, and 144-Me. beams. Reports on Field Day operation were received from ASQ 9, Eau Claire; CRQ 9, Menomonie; NOQ 9, Chippewa Falls; UDU 9, Racine; APU 9, Beaver Dam; DPN 9, St. Point; RNZ 9, Neenah-Menasha; ESJ 9, Milwaukee; RQM 9, Wausau; HHX 9, Milwaukee; ITH 9, Sheboygan; RKT 9, Manitowoc; FMH 9, Manitowoc; UIM 9, Sturgeon Bay. AFT put up a new sixteen-element beam for 144 Me. IQM is working on an all-band rig. IQW attended the BEN picnic. SUF bags plenty of traffic on his 7200-kc. schedules. ESJ experienced a case of Tennessee Valley Indians, and was willing to swap it for some BCI! ANM is rebuilding rig into cabinet. ERW did some Field Day operating. DSP has new 3.85-Me. mobile. RKT built new 28-Me. converter. JAW can be heard on 28-Me. mobile-marine on Lake Michigan. VAU is new Mancorad member. TQV, JAW, HPC, GI, OMO, and BZU hold forth nightly at 8 P.M. on 29.6 Me. QGQ had contact from his mobile to an airborne mobile. BVU is working the West Coast on 3.85 Me. with s.s.s.e. CTH has been holding to an accuracy of .00001 per cent in the last two Frequency Measuring Tests. IWT is leaving the section for Oregon. LIK has new TBS rig in use as mobile. JM and GJK are after Class A tickets. CTH keeps us informed on Door County activity. New officers of the Milwaukee School of Engineering Club are: HWV, pres.; GJX, vice-pres.; Weston, secy.; Woods, treas.; JRW, sgt. at arms. A heavy schedule of hamfests this summer has kept GPI on the run. FMH operated as mobile in Field Day. FPE uses p.p. VT127As at 700 watts on 144 Me. with daily schedules into Minnesota and Illinois. Traffic: W9ESJ 449, SUF 294, CBE 30, FXA 18, RQM 9-17, IQW 16, UTT 9, UDU 9-8, IQM 9, AFT 3, YCV 2, HDZ 1.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Rev. Lawrence C. Strandenaes, WØIWY — The section mourns the loss of one of its old-timers, Professor Thomas Jackson, FX, of Jamestown College, whose amateur radio days began during the time of World War I. Only four more states, and HKJ will collect his 7-Me. WAS certificate. PUJ was portable when he took in the National Scout Jamboree at Valley Forge, Pa. in July. VSK also worked portable during his vacation in July. His compact little rig covers 160 and 75 meters with 18 watts input. NPL, in Mohall, lays down a fine signal on 160 meters with his new Johnson Viking I rig. SRH is using his Millen exciter on the same band. IPC recently finished work on his 300-watt four-band final, using push-pull 814s. NQY is on 3.85-Me. 'phone with a Collins 32V-1. Your SCM invites reports and news from all hams in the section and requests all appointees to be faithful in making their reports at the end of each month.

MINNESOTA — SCM, John B. Morgan, WØRA — Acting SCM, Charles Bove, ØMXC, SEC: BOL. News and traffic reports are at a premium this month. Of course, being in the land of ten thousand lakes that is to be expected. Mobile operation has just about doubled this year as compared with last year. AA has purchased five acres for an antenna farm. BGY has finally mastered the electronic key. He now is looking for new fields to conquer. ITQ and EPJ have organized a code and theory class at the Sister Kenny Institute Hospital. They even have a couple of the nurses enrolled. Aiding in code and theory classes are AUI, HZR, PKO, FDS, and MXC. The Minneapolis Radio Club, Inc., has applied for a station license for its three transmitters. YBM has a motor-controlled e.c.o. on his mobile rig. MLT is working in Detroit Lakes and has a rig with him so he can check into the net in the evenings. EA's report was simple and to the point. It said, "fishen." PVS now has worked one hundred countries. With fall coming on we would like everyone on e.w. to check into the Minnesota e.w. net on 3795 kc. at 7:00 P.M. If you are a beginner the net control will slow down to your speed. The 'phone net also asks everyone to check into his net on 3960 kc. at 6:00 P.M. week-days. We need more Official Observers in this section, and if you are qualified and interested in any other appointments, drop a card to MXC. Join the Emergency Corps now by asking your AEC for an application blank, or write BOL, your SEC. Traffic: WØITQ 152, EA 32, MLT 29, RJF 27, PVS 4.

DELTA DIVISION

ARKANSAS — Reported by W5EA and W5DRW: The quarterly Cat Fish Club, at the last meeting June 4th at Spring Lake, had 84 hams present. With XYLs, etc., more than 200 represented. Oklahoma, Kansas, Missouri, Mississippi, Louisiana, and Arkansas. The proposition of ham call letters on Arkansas auto license plates was given some deep consideration and we in Arkansas hope it can come to pass. There were 30-odd mobile jobs at the meeting, both 3.85- and 28-Me. 'phone. The Fort Smith Radio Club worked four bands in Field Day, with ICS 5 at Mountainburg, Ark. Don't forget OZR 3695 kc. 7 P.M. CST and Arkansas Emergency 'phone net 3885 kc. 6 A.M. CST each Monday.

LOUISIANA — SCM, Robert E. Barr, W5GHF — LV is over the 100 mark in countries worked using 32V-1 and 75A-1. FTU reports from Japan via JA2CV. DRF is improving after a serious illness. KCH also is recuperating after a long seige in the hospital. CNG's latest is 3.85- and 14-Me. mobile. Thanks to VT for the reports relayed to the SCM. USN and the New Orleans Naval Reserve are making plans for possible hurricane emergencies. OJX now is located in Emerson, Ark. CYF is on 7 Me. from Bonita. EGX and PXH now are with the Naval Reserve. RIL is a new ham in Opelousas. CTI is working 28-Me. 'phone with HT-9 and three-element beam. VT expects to be active soon. DXL built a new 200-watt all-band 'phone-c.w. rig. POB is on 28 Me. from his new home. LER now is high-powered with a store-bought rig. JET and HEJ furnished Monroe reports. IVF is on 14- and 28-Me. 'phone. The 7-Me. gang in Monroe includes PRW, PZL, QED, MWE, and OIN. The gang at USN are attempting to establish 144-Me. contacts with Shreveport. The Baton Rouge Amateur Radio Club mailed copies of the license tag resolutions as passed by the Louisiana Legislature to all hams in the State. ZS is a foremost TV antenna designer. NOX is on 3.85 Me. at Gramercy. GHF has bi-weekly schedules with Okinawa. BMM, CEW, and CGC hold noon-hour schedules on 3905 kc. CEW still is forging upward on the DXCC list. EM is working Pacific Area traffic on 14 Me. Traffic: W5EB 54, GHF 36, CEW 26, HEJ 22, QH 10.

MISSISSIPPI — SCM, J. C. Wallis, W5DLA — This month reaches a real low in news and activity. One reason is that most of the gang are on vacation. Field Day should bring more news next month. Traffic has hit bottom sooner than we thought, but I'm sure that next fall will bring up the number of those participating in this useful activity. I wish to announce that IHP has been appointed Phone Activities Manager for this section as of July 15th, and I'm sure that Graham will meet with the approval of those interested in seeing promotion of 'phone activity for this coming season. Please check the expiration date of your various appointments, and let's keep up the good work and make a much better showing for Mississippi in the future.

TENNESSEE — SCM, D. G. Stewart, W4AFI — Reports indicate Field Day was a huge success in our section. Clubs reporting: ORRAC FDF/4, MSARA VT/4, SMARC OLB/4, NARC KH/4, KARC JD/4, CARC ETN/4, and JRC GEH/4. Non-clubs: FLW/4, with APC, LC, LCU, NXH, NYY, ONX, and RMJ assisting, and ROS, with LRO and BS. AFI visited and operated with FDF/4. ODR is club station at NATFC, Millington, with 800 watts on 14-Me. c.w. PSR is having his TVI troubles. PL, after pressure on the NYL and doctor, bounced back on the Hit and Bounce Net and made the customary BPL. RMJ, a new ham in Paris, is operating 28-Me. 'phone and 14-Me. c.w. FDF received a Public Service certificate for his work in the Ohio freeze. LMO is batting off DX on 14 Me. with folded dipole. FDF, OJZ, and NDE are on 3.85-Me. mobile. It appears KMH has set the pace for 3.85-Me. mobile in O.R. BAQ vacationed and visited APC for fishing. MSARA had a nice attendance at its June outing. Vic Canfield gave an interesting talk. Other visitors were CCJ, TM, and 5HP. FQN is in Oklahoma on CAA business.

DLI traded for a new RME-45. QT had a visit from a reporter, resulting in a write-up complete with photo. MJK has troubles with his kw, so has turned to TV. BBT acquired a new QTH with an eye for antenna space. AFI and HG visited the Kentucky hams at Mammoth Cave. JHH is pushing his 813 final with a new VFO. FVM is putting a BC-610 on 28 Mc. FLS is taking an extension course in electronics. Traffic: W4PL 898, ODR 6, AFI 4, FLW 4, BAQ 3.

GREAT LAKES DIVISION

MICHIGAN — SCM, Robert B. Cooper, W8AQA — Asst. SCM e.w., J. R. Beljan, 8SCW. Asst. SCM U. P., Arthur Kohn, 8TTY. SEC: GJH. RMs/QMN: UKV, TRN, PAM: YNG. UKV made BPL this month as the result of some very active assistance on the part of 2RTZ/8, via SSN and ESN. New appointments include OPS to TQP, OO Class II to BGY, EC for Midland County to BVY, EC for Van Buren County to AYV, EC for Jackson County to LKV, EC for Osceola County to CRH, EC for St. Clair County to FWQ, EC for Montmorency and Osceola Counties to ZHB, and EC for Mt. Clemens County to DUK. DLZ announces that COF is his Asst. EC. YNG was host at the Annual Picnic of the Buzzards Roost/Michigan Emergency Net. New officers for the ensuing year are JUQ, pres.; AQA, secy.-treas.; and YNG, who will continue as MEN Manager. Emphasis was placed on mobile operation and it was decided that the net procedure for the "BR" was to include a 15-second stand-by for mobiles at 15-minute intervals starting at 5:30 P.M. The very good openings on 144 Mc. during Field Day brought some very fine reports from ZCH. OAF spent most of his Field Day time working with a 3.85-Mc. mobile but found conditions very rough. TBP reports the antenna supports for the Muskegon set-up on Field Day were the portable truck towers furnished by MRL, who uses them for TV demonstrations. ØVDR is a new operator in the Grand Rapids Area. EXZ is spending the summer in the Traverse City Area with a portable rig to work out the kinks in his new "bug." DED reports FIZ as the newest Holland (Mich.) ham. YKC's visit to Headquarters found Tom's call (YCK) near enough to be really confusing. TTY reports the Iarium Club membership at a high point and new hams in the Copper County are FMT, FNF, FMS, FJF, and FKI. GJH calls your attention to the proposal to use 3663 and 3930 kc. as the state-wide emergency frequencies and would appreciate your comments on the choice of an assignment on the 7-Mc. band. TRN keeps schedules with 8RN at 2030 and EAN at 1930 and will appreciate assistance, both with incoming and outgoing traffic this summer. FX reports a Field Day score of 3700 for the DARA's two transmitters. SWF is getting around after a session of blood poisoning. Traffic: W8RJC 391, UKV 144, TRN 121, DAP 66, EXZ 61, AYV 40, CRH 32, DLZ 32, AQA 30, YKC 30, DED 14, TBP 12, WVL 10, FX 3, OAF 3, YMO 2, ZZ/8 1.

OHIO — SCM, Dr. Harold E. Stricker, W8WZ — Asst. SCMs, Charles Lohner, 8RN, and C. D. Hall, 8PUN. SEC: UPB. PAM: PUN. RMs: DAE and PMJ. New appointees are EZE as ORS and AJW as OPS. It's nice to get a Cleveland outlet on 'phone. We could use more active 'phone outlets in several of the larger cities. Our Director, SPF, and I visited with the Louisville, Ky., Club and attended a ham reunion at Mammoth Cave, Ky. SPF spoke on the latest League developments at both places. A very enjoyable time was had by all. The boys in Ohio had a chance to do some real emergency work in a four-hour cloudburst in the region of Roseville and Crooksville, Ohio. The *Cleveland Press* states that "Communications with Roseville were only able through mobile amateur units." The boys doing the good work were DVH, LQB, AZR, ZYW, and YOM. A total of 78 messages was handled. Our hats are off to these fellows. Our Director visited with the Alliance Club on July 29th. FPA, FPB, and FPM are new hams in Springfield. Field Day is over and conditions in Ohio were very poor because of rain and QRN. In fact, the boys from the Canton Club had a little creek suddenly become about 5 feet deep, and when the picnic tables started to float by they took to higher ground. At our spot we didn't need any lights, as nature took care of that; it also took care of the total contacts. PIH sent up a balloon 800 feet and Benjamin Franklin had nothing on him for drawing arcs. This all happened during Field Day. The Mansfield Club will have as their next speaker WXV, who has just broken the record for distance on the 144-Mc. band. Don't forget the Columbus Amateur Radio Association Hamfest on Aug. 27th and the Greater Cincinnati Amateur Radio Association Hamfest on Sept. 17th. The Cincy Hamfest is a stag affair. The Columbus boys on v.h.f. have been very active lately and some hot stuff has been coming through. Don't forget that the various nets are meeting throughout the summer. Many Field Day messages were received via mail and all checked OK. LYF and TKS have installed mobile rigs in their autos and are mobiling around Toledo. EJX was awarded WBE and BERTA. JNF handled 33,944 QSL cards during the first half of 1950. BLB, DTD, and DNJ received their Class A licenses. PAU has a new 10–20 rotary beam. WRN and UZ sent in long OES reports. Nice letters were received from WDQ and IVC. GZ worked 17 states and Canada on 50 Mc. during June. LBH has just worked his 37th state on 50-Mc. 'phone. DAE, who is RM and NCS for BN, wishes more fellows would QNI in BN on Monday, Wednesday, and Friday at 7:00 P.M. AQ is renewing old acquaintances on 3.85-Mc. 'phone. He was your SCM several years ago. CBI is doing a lot of rebuilding. EDP operated LJ/8 from Dayton on Field Day. Traffic: W8DAE 141, EZE/8 116, AL 59, SG 52, GZ 40, DSX 32, WAB 19, AJW 18, QIE 15, DXO 10, AQ 6, IVC 6, DZO 4, WZ 4, EDP 3, BEW 2, CBI 2.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Fred Skinner W2EQD, — SEC: CLL. Dick, ex-MHW of Port Jervis, has left IAW for a position with Turner Microphone Co. in Cedar Rapids, Iowa. Look for him soon from WØ-Land. A fine Emergency Corps conference was held in Poughkeepsie with CLL as chairman. Twenty-four Coordinators and League members attended. QGH replaced ITX as EC for Westchester County. NJF is now EC for White Plains and SQW is EC for Scarsdale. LRW received a Section Net certificate for NYS operation. FZW was appointed OO and ORS. NIV has accepted appointment as PAM. GYV is back on 50 Mc. for the summer and is out for WAS with his new beam. PHO is active on NYS, NYSS, SSN, and EAN. Traffic: W2PHO 183, TYC 86, CLL 67, EQD 23, FZW 14, NJF 11, QGH 11, BRS 4.

NEW YORK CITY AND LONG ISLAND — SCM, George V. Cooke, W2OBU — Asst. SCM, Harry J. Dannals, 2TUK. SEC: BGO. RMs: BYF and PRE. PAM: GSC. With upward of 50 mobile units backed up with over 125 fixed stations operating on 3.5, 3.85, 7, 28, and 144 Mc., we are ready to operate at disaster scenes if necessary. The Northern Queens AEC has shown the greatest strides under PQG, EC for that district. Fifty members have been signed up and are actively engaged in strict drills on 147.6 Mc. at 2100 on Mondays, with TJA as NCS. Internet frequency is 146.25 Mc. NFU heads 28 Mc. almost solidly mobile at 1900 on Thursdays with 29.640 Mc. as internet frequency. LGK, FNI, and IHE conduct the liaison work with Northern Queens on 3.5, 7, and 14 Mc., and are organizing local nets on these bands. The Suffolk County AEC, headed by KDB, the EC, reports nets established as follows: 1200, Sundays on 3995 kc. 'phone and c.w.; 1900, Mondays on 3600 kc. with AJF as NCS; and the 146.8-Mc. net at 2045 on Mondays with MZB as NCS. The Suffolk AEC groups are concentrating on mobile operation, duplicating the Northern Queens pattern. Ten mobiles and 2 maritime mobiles working with 9 fixed stations give very good coverage on 3.85 Mc. Eight 3.5-Mc. stations, 5 of which use gasoline-driven generators, are equipped to serve on 144 Mc. as well. ANN, a Nassau EC, has moved to New Jersey. SPI will fill in the spot vacated by Hank. The group in Nassau is extremely active, and 25 stations report for weekly drills, 4 of which are mobile on 144 Mc. Internet operation continues during drills on 146.25 Mc. by contacting neighboring counties. The 10-meter net in Southern Queens, headed by IAG, as EC, holds two drills on Thursdays on 29.520 Mc. at 1900 and 2200 and includes 11 mobiles of the 21 active members. Plans are now being made to coordinate the several nets for full activity and preparedness, to function as one AEC group on at least five bands with both fixed and mobile operation. The early summer picnic held for all section appointees at Bethpage State Park was a big success. The next picnic is scheduled for Sunday, Sept. 10th, at the Bethpage State Park Picnic Grounds. All section appointees are invited. The NLI traffic net, operating on 3710 kc. Mondays through Fridays at 1900 and 2200, has resumed its winter schedule and, with the guidance of BYF, expects to carry the greatest amount of traffic in its history. The Nassau Radio Club elected the following officers for '50–'51: TUK, pres.; VL, 1st vice-pres.; QBS, secy.; Tom Hahn, treas. The next meeting will be held on Sept. 8th at 162 Main St., East Rockaway. The Knickerbocker Radio Club's new officers are: FCT, pres.; AAU, vice-pres.; VVP, secy.; EFZ, treas.; UYR, sgt.-at-arms. LGK specializes in recording WIAW code practice for those needing aid. CLA holds schedules with OOTs at 1900 nightly on 3990 kc. and with CAP, New York Wing, at 2100 on 2374 kc. UTB, ex-7 DTC, has just arrived in the section. KDC is enjoying 3.85-Mc. mobile. VNJ built RK4D32, 100-watt final. BQP announces the Sewanhaka classes in code and theory will be resumed the 2nd week of September. SQB is on 144 Mc. with new VHF-152. OES and OPS appointments went to KVG, TJA, and NFU. OPS appointments were received by WJX, BAE, RCN, CVU, ZLM, VNB, and YEF. OO Class III appointment went to BNX. OO Class III and IV certificates were issued to MJL and UTB. Traffic: (June) W2OBU 139, VNJ 105, SJC 48, MQB 44, ZRR 31, VWH 20, LGK 17, TUK 15, YDG 10, JBQ 8, OAF 7, KDC 6, PF 6, ESO 4, RTZ 2, QB8 1. (May) W2CLA 23.

NORTHERN NEW JERSEY — SCM, Thomas J. Ryan, jr., W2NKD — NNJ Net 3630 kc. 7 P.M., nightly except Sunday; NJ Slow Speed Net 3630 kc. 7:30 P.M., nightly except Sunday; NJ Phone Net 3900 kc. Sunday 9 A.M. All stations are urged to send monthly report cards on their activities. OUS schedules KZ5CD Saturday at 10 A.M. on 28 Mc. besides his broadcasts of ARRL Bulletins on 1823 kc. at 6:15 P.M. on Tuesday, Thursday, and Saturday.

If you miss W1AW, catch the bulletins from OUS. CWK is rebuilding. NIY is doing great work as one of the guiding hands in the NNJ Slow Speed Net. Interested in slow speed c.w. work? Drop a card to CWK, Box A-10, Haworth. Field Day messages as credit toward scores were received from Ocean County ARA, Union County ARA, Northern NJRA, and Raritan Valley RC. The Jersey Shore ARA and the Monmouth County ARA combined to form the Garden State ARA with the call GSA. The new organization has more than seventy-five members, OMs and YLs, from age 14 to 75, from all walks of life. They meet on the second and fourth Wednesdays at the Long Branch YMCA. This month they will play host at the Hudson Division Convention in Asbury Park. BFP has switched to 28-Me. 'phone. HXU is chasing DX on 14 Me. AIF, BGI, DZH, GYE, VLK, and K2CR are new members of Northern NJRA. BTZ is new president of the Union County ARA. Have you called your local EC to inquire how you can help in next month's Simulated Emergency Test? He'll welcome your call. Traffic: W2CGG 225, NCY 172, NKD 19, OXL 13, AWY 10, CWK 9, OUS 7, NIY 6.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — Messages were received from JAD reporting on Field Day operation from Eagle Point, Clinton, with 95 watts on 3.85-Me. 'phone, 30 watts on 7-Me. c.w., with 10 operators. SWD operated from Memorial Park with five operators. TIU reports 4 Field Day operators 2 miles east of Gilman. FZO reports 35 operators near Sioux City. SQN reports six operators and 2 transmitters in Memorial Park, Ottumwa. FP sends a whole page of pictures from the Davenport paper showing the boys in their Field Day operations. Contacts were as follows: 69 on 14-Me. c.w., 65 on 7-Me. c.w., 63 on 3.5-Me. c.w. and 35 on 3.85-Me. 'phone with a 654. RYJ reports the Cedar Rapids gang out with three transmitters, six receivers, and an emergency power generator. The SCM forgot about Field Day until the messages started to come in. QVA reports that QAO now is in Washington, D. C. FDL reports two new hams in Muscatine, BKJ and BMZ. Two clippings were received from the secretary of the Muscatine Club giving the results of the club election and news of a simulated emergency put on by the club. The fellows had contact with the outside world in less than an hour after a surprise notification. They worked in conjunction with the local Red Cross Chapter. The new officers elected were Chas. R. Van Dyke, pres.; Richard Havercamp, vice-pres.; Herb Tousaint, secy.-treas. The Club had over 200 contacts on Field Day. Traffic: (June) WØQVA 29. (May) WØHMM 514.

KANSAS — SCM, Earl N. Johnston, WØICV — Activities this month seem to center on 50 Me. IPI, one of the leading 50-Me. stations, reports that June 18th was the best opening in over a year. Ben worked twenty-three states in all call areas that day. Also contacts have been made with ZKF at Wichita, a 105-mile hop, on 144 Me. DSR was worked May 31st 135 miles away. We know of many more Kansas stations on the ultra-highs, such as PKD, MVG, QDH, YYW, UQM, ZKF, SO, BPL, and LNW, and would appreciate hearing from them. SGK, of Wichita, has applied for AEC membership and has a nice bit of emergency equipment. New officers of the Kansas State Amateur Radio Club are DEL, pres.; GTT, secy.-treas.; LQV, chief 'phone operator; AHM, chief c.w. operator. It is planned to organize a KSG (Kansas State Graduates) Net to meet on the 2nd and 4th Thursdays at 9:00 P.M. CST on 3995 kc., either 'phone or c.w. QQQ will be Net Control and all grads are invited to call in. The first meeting will be the 4th Thursday in September. All former Kansas State amateurs are urged to report in to re-establish old acquaintances. BBP is a new station in Manhattan. The KVRC held annual Field Day at Lake Shawnee. On July 4th the KVRC furnished communications between the two Red Cross field stations at the Lake and at Headquarters in the New England Bldg. Mobile stations ECF, AAZ, ABV, and ICV were members of the Red Cross Motor Corps. UPU, ABV, AAZ, ECF, HOC, WGM, OZF, HS, QV, HBL, and ICV participated. Traffic: WØFDJ 8, LIX 6.

MISSOURI — SCM, Pen R. Wendt, WØICD — Reports received at this office indicate that Field Day activities this year increased over last year. More club participation, more individual participation, and more mobile participation with greater enthusiasm indicates an upward trend in amateur Field Day activity. Start plans now for the Simulated Emergency Test. QAC, TZX, BIH, QMF, and PML/9 made up the Field Day team at Perryville. OUD has been on 7030 kc. most of her operating time with 35 watts to an 807. MON (Net) is moving to 3580 kc. this fall. Quite a bit of traffic is flowing on 7140 to 7160 kc. seven mornings a week, is the report from QXO. If you are having difficulty moving traffic, try those frequencies between 5:00 and 8:30 A.M. GBJ hopes to be on from his new QTH soon. The antenna still needs erecting. The Bluff Amateur Radio Society reports FB activity during Field Day. GNX received his Class A license and can be contacted on 3.85- or 14-Me. 'phone. BBA is a new call at Poplar Bluff. AXL is completing a 3.85-, 14-, and 28-Me. mobile rig with push-button band-changing. MTB has his rig operating from his new QTH in Poplar Bluff. LSA is working on mobile gear for his new 1950 Frazer. OMG tried out the Meissner Signal Shifter on 14-Me. c.w. using the 75-meter antenna and worked G6FV and G2GM for his first contacts. The HARC AEC has reduced its active list of net members by taking the inactive members off of the roll call. AEC participation in Kansas City is now about 30 per cent mobile. Reports indicate that the number of 28-Me. mobiles in the section is increasing rapidly. UBR reports mobile operation while vacationing is great stuff. He contacted home stations and enjoyed his vacation with the mobile very much. Traffic: WØQXO 402, CGZ 8, QMF 4, OUD 2.

NEBRASKA — SCM, Scott E. Davison, WØOED — The big meeting of the Ak-Sar-Ben Club in Omaha with HCP was followed by the swell hamfest put on by the North Platte Club. A week later the 3.5-Me. c.w. and 3.85-Me. 'phone nets held their annual picnic at Columbus. This was followed a week later with a big picnic and charter party held by the Falls City Club, with the SENRC helping to welcome the new club as an ARRL-affiliate. But when Field Day arrived the whole State joined in the scamper for points and contacts. Clubs of Auburn, Lincoln, North Platte, Scottsbluff, Sidney, Fremont, Omaha, and Falls City were in the field. LHZ gets out FB with his 8-watt 3.85-Me. mobile. HZE now is mobile. GPE is sporting a new Class A ticket. When QHK had his appendix removed recently BBX, HZE, and EHF set up 28-Me. portable at the hospital for him. NZ and QHG have put up new all-band antennas. NKG has said "I do." APK is DXing. AGP is on 7 Me. from Waterloo. New officers of SENRC are GJM, pres.; MYT, vice-pres.; AYM, secy.-treas.; LPU, act. mgr. The NENRC has reorganized and new officers are JED, pres.; DHO, secy.; and ZUT, treas. BXJ has new mobile with Clamp tube modulation and 40 watts. VDC has now worked 100 countries. BDQ has new mobile rig. New officers of the Pioneer Radio Club at Fremont are UVQ, pres.; AZC, vice-pres.; ADK, secy.-treas.; LSS, act. mgr. The Fremont Club sported new club call, BGG, on Field Day. OAO has new HRO-50. AYO has new Globe King. Traffic: (May) WØFMW 37, IXL 15

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Walter L. Glover, W1VB — LKF, our SEC, has just issued a new CAREC bulletin which gives a complete listing of all EC appointees with their addresses, telephone numbers, etc. We now have a total of 44 ECs in the section, but many towns are not represented. Anyone interested, get in touch with LKF. The State Police Auxiliary Program is progressing satisfactorily, and when complete will be a fine addition to our emergency system. DJV is running 5 to 8 watts to a 6J6 with a three-element beam on 54 Me. OJR reports WN has both 144- and 3.5-Me. mobile rig in his service truck, and is the mainstay for the local EC gang. YBV has moved to Monroe. BDI has a summer screening program all mapped out to kill TVI on the big rig. Field Day has come and gone, with several unofficial reports coming in. Local thunderstorms in the western area of the section slowed up operation during the earlier hours. VB lost a power supply because of a leaky roof. RMU has resigned as EC. Following are new ECs: BFL, RPX, AQT, SVB, FOB, CQF, HRR, AJO, MRP, SED, STU, and NZM. LV has been rebuilding. It has been necessary lately to cancel some appointments because of lack of endorsement of certificates, and also lapse of ARRL membership. It is possible there may be more, so if you still are interested, fellows, send in the certificates, and you will be kept on the mailing list. Traffic: (June) W1NJM 240, BDI 89, LV 86, RWS 69, DJV 55, KV 54, BVB 41, CTI 28, BIH 21 BGT/1 17, HYF 14, ORP 14, EQ/1 9. (May) W1KV 193, CTI 63.

MAINE — SCM, Manley W. Haskell, W1VV — Pine Tree Net, 3550 kc., 1900, Mon., Wed., Fri., summer schedule, RM NGV, Sea Gull Net, 3961 kc., off for the summer, PAM FBJ. Traffic will be handled by stations present at 1900 hours. New ORS is SUK/SZM, Kennebunk, with a message count of 111 points. He operates two stations, one at home and another at work. RM NGV has moved into a completely new shack. Future members of PTN are SWZ, BKU, and ESJ, an old prewar PTN member. NGV says RQR deserves special mention for keeping the ball rolling all the time. CRW will be at the Portland Hamfest with NGV. Other hot traffic men will include 2CLL, QMJ, 2CJP, and possibly EOB. RQR had 28 brasspounders at his QTH for a "clamfest." New operators were recruited for the PTN. The Deep Sea Drag Net continues to operate on 3961 kc. at 1145 hours daily, except Sat. and Sun., and is now one year old. NCS is PU of Garter Snake Haven, Cape Ann, Mass. EOF helped BGU/M through the customs at the Canadian border. Compiled data indicates sixteen 3.85-Me. mobile units and about ten 144-Me. units operating in the State as of this date. SFZ, who is OO, gets our thanks for speedy reports. He says that the American amateur as a whole has the cleanest signals. Traffic: W1SFZ 187, RQR 160, QUA 144, LKF 130, SUK/SZM 111, NGV 72, VV 61, SWX 24, PTL 8, COV 6, SJN 2, AMR 1, KDE 1.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — The main interest this past month was Field Day. The Framingham Radio Club, the El Ray Radio Club, and the Quannapowitt Radio Club were all out. The Waltham Radio Club, M4H/1, was up in Nashua, N. H. The Submarine Signal Radio Club was down in Plymouth. The South Shore Amateur Radio Club has received the call of one of its deceased members, IA, which was the call of Dr. George Ryder. The Club took part in Field Day down in South Middleboro at FWS's place. LML had his ORS appointment endorsed. TAA is a new call on 144 Me. HAS is on 144 Me. NBS moved back to Dedham and will be on the air again. KSB has a rig on 144 Me. in his car. NR is having trouble with his rig on 3.85 Me. 3PGP, ex-1HKW, now of Laurel, Md., was on 144 Me. from his car from Hull, Mass. SYV is a new ham in Marblehead on 3.5 and 28 Me. He attends Milton Academy. MPH, in winter. Most of the nets have reduced schedules during the summer. SS received his fifth Public Service certificate. PU is Alternate Net Control for TCPN on 3970 kc. for the New England Area at 7 P.M. JCK took some of the traffic from MX at its Open House. G3FYV was in this country on a business trip and while in Lynn for a few days visited a few of the local hams. PLQ is out of school and has a rig on 144 Me. SZO is the call of the secretary of the Merrimac Valley Amateur Radio Club. RLF has moved to Everett. RKG has moved to Colorado. RAP is new treasurer of the Club and SWL Fitzpatrick is new board member. NNG got married. OGU is no longer mobile. SLW has his Class A ticket now, which makes five out of seven down on Martha's Vineyard. RMJ graduated from Massachusetts Radio School and is going to work on WOCB at West Yarmouth. MGP is back in Saugus and has a lot of surplus equipment to fix up. K1MRV is the call of Battalion 1-6 "South Shore Battalion" at Hingham. Anyone interested in joining should get in touch with Commander Arthur C. O'Day of Milton. RSY writes from Copenhagen, Denmark, where he is staying with OZ3EA. The T-9 Radio Club met at IPK's shack and had ARRL's TVI film. The South Shore Club held its last regular meeting at WBZ-TV through the courtesy of IVI. The Club will meet on the 3rd Friday at the Quincy YMCA during July, Aug., and Sept. Ex-1JO now is 3JO and is on 7010 kc. He says 73 to DZ, CH, BXC, and HX. SMO has his 20-w.p.m. Code Proficiency certificate and has a rig in the car. BVL says he is very busy working on tubes for TV at Hytron. Traffic: (June) W1LM 162, TY 61, SS 56, DMS 49, PU 35, NWL 4. (May) W1JCK 278, RXT 73, DWO 8.

WESTERN MASSACHUSETTS — SCM, Prentiss M. Bailey, W1AZW — SEC: UD. RM: BVR. Net frequency is 3725 kc., Mon., Wed., Fri. at 7 P.M. Net call is WMN. Reports on Field Day have come in from Worcester, Springfield, Holyoke, and Pittsfield. The Holyoke boys set up at GZL's camp in South Hadley. EOB, RZG, and JYH operated EOB/1. QWJ and the boys took to the mountains and worked on 6, 2, and 1¼ meters. Five contacts were made on 420 Me. also. NY and his gang held forth on Wilbraham Heights. The PRC boys were at Bousquets, about 4 miles outside Pittsfield. SAN headed 3.5-Me. c.w. set-up. JGY took charge of 7-Me. c.w. and IZN took over 3.85-Me. 'phone. DPY furnished the 14-Me. c.w. and 'phone outfit. LUD was in charge of the power supply department. Bob Saban, Bill Parker, and BEE are new members of HCRC. RFU received Class A license. Congratulations to EOB and APA, who now have sufficient confirmations for DXCC. JYH now has worked 218, with 196 confirmed. Roger has been sneaking some early morning 'phone contacts to make it 76 on 'phone. RZG operated at EOB/1 during Field Day. JYH handled traffic from MB3M, who is QCN from Longmeadow. BVR has 60 watts on 3.85-Me. 'phone. Perce adds that he still is on c.w. MOK says the Holyoke emergency net meets the third Wednesday of each month at 7:30 P.M. GVJ now is settled in Feeding Hills at 14 N. Westfield St., ready to start on his new position as Superintendent of Agawam Schools. BDV operated during Field Day with his portable from York Beach, Me. AZW was visited by ENY and RM and was buzzed on the land 'phone by MUN and VE2AGG. By the time you read this, vacations will be over. Let's hope you have all your rebuilding done so that we can swing into the most active season we have ever had. Traffic: W1EOB 75, BVR 68, RZG 16, GVJ 6, JYH 6, BDV 1.

NEW HAMPSHIRE — Acting SCM, Clifton R. Wilkinson, W1CRW — RM: CRW. KYG writes me that an attempt is being made to secure call letters for license plates. The necessity for a top-notch emergency network now is needed more than ever to do this. Let's show them that we can do it. Let's have some suggestions as to the day, time, and frequency. QJY hopes to be back operating in the NHN this fall. He also reports operating in Field Day with the Manchester Radio Club. OO reports still are pouring in from POK. MXP had to get rest so laid off everything, even radio, but we expect him back operating very soon. The NHN will go back on full-time operating Sept. 5th. Let's originate plenty of traffic and keep 'em busy. PFU's antenna snapped during a wind storm, but it's up sixty feet now. QIX doesn't have too much spare time but always manages to QNI NHN. CRW is mobile from 3.5 to 28 Me., both 'phone and c.w. Remember the AEC; also remember to renew your appointments. Traffic: (June) W1CRW 176. (May) W1RFP 13.

RHODE ISLAND — SCM, Roy B. Fuller, W1CJH — SEC: MIJ. RM: BTV. PAM: BFB. RIN's summer schedule is Mondays, Wednesdays, and Fridays at 1900 on 3540 kc. This year's Field Day had the biggest turnout in Rhode Island's history of the event. The Newport County Radio Club's equipment was set up around the war memorial monument in the city's park, with the antennas strung from the memorial. Twenty operators were on duty during the 24-hour period. The PRA set up in North Providence with eleven operators present. In keeping with its system of the past, NAARO set up at a new location in East Greenwich with fifteen operators dividing the duty and the club's HTBs (hams-to-be) performing the less pleasurable tasks around the camp. The PRA's dinner party was a big success as usual and yours truly and his XYL were guests of the PRA at this function. NAARO's treasurer, QOG, now is located in W6-Land.

VERMONT — SCM, Burtis W. Dean, W1NLO — Don't forget the Annual Vermont Hamfest and State ARRL Convention Sat., Oct. 14th, at the Hotel Vermont. Congrats to the Tri-County Amateur Radio Club of Brattleboro on becoming an ARRL affiliated club. MEP and NH worked QWJ on Mt. Wilbraham, Mass., from Mt. Equinox on 420 Me. Field Day. They also made 11 contacts on 50 Me. and 44 contacts on 144 Me. The BARC operated from BRO's camp in South Hero on 80-, 40-, and 20-meter c.w.; 160-, 75-, 20-, and 10-meter 'phone with BRO, NLO, OKH, PIT, QQN, QVS, RPR, SEL, and QEG as operators. CGW operated maritime mobile Field Day with 80-654 in his 14-foot outboard motorboat. RNA, RLS, and RWX operated at Bluffs on Lake Memphremagog. AEA and SPK were out with their emergency rigs on Field Day and made 68 and 87 contacts respectively. KJG has vertical "J" antenna and is trying to work the Vermont gang on 20-Me. ground wave. SUF is Edward Cook of South Barre and SUI is Zyg Rybak of Morrisville. 2FMQ is operating mobile from Chittenden. "PI" has an FB 28-Me. mobile rig in 1950 Ford. Traffic: W1AVP 10, AXN 8, IT 6.

NORTHWESTERN DIVISION

ALASKA — SCM, Charles M. Gray, KL7IG — Messages on Field Day activities were received from NK, OW, and FA. NK operated with one operator at Anton Larsen Bay, Kodiak. FA and OW operated portable in the Juneau Area. FA ran 10 watts from battery-power alternating batteries while charging to a 110-v. inverter. The Juneau Ham Club went under the call of OW, with OW, JE, FM, CZ, AAR, IG, AEQ, and 7VUV taking turns at the two rigs. One was a 250-watt rig and the other a 75-watt rig used on 3.5, 3.85, 7, and 14 Me. ADQ, at Nome, is running a Viking I on 3.85- and 14-Me. 'phone and 14-Me. c.w. He worked 27 countries in 7 weeks even with QRM from a CAA station close by. SC, Larsen Bay, Kodiak, is running 250 watts to 813 on 7-Me. c.w. and 4-Me. 'phone to a 1000 foot-long wire. Traffic: KL7SC 53, SF 4, ADQ 1.

IDAHO — SCM, Alan R. Ross, W7IWU — Twin Falls: JMX reports that the last club meeting was a going-away affair for IOA, who has resigned his teaching job and is retiring to Arizona. JMX and MMO were out on Field Day. Don't forget the Magic Valley Hamfest to be held in Rupert Sept. 16-17. Boise: HPH, of Anderson Dam, played host to the Gem State Radio Club. There were six or seven mobiles, and an enjoyable time was had by all. Anyone desiring a copy of "Emergency Communications" or "Operating an Amateur Station" will be mailed one pronto. The operating booklet describes the various SCM appointments and queries from you are welcome. Do you have a 80-221, or other frequency meter? You can have fun with it in the ARRL Frequency Measuring Tests. Apply for an Official Observer application blank. Have you heard a sour note and wanted to tell the guy? Send him an OO card and do it "legal like."

OREGON — SCM, J. E. Roden, W7MQ — Baker: AOL reports that LQW, EC for Baker Area, has almost 100 per cent AEC sign-up in Baker. OLO is newly licensed. Bend: HHH reports that Prineville now has a second ham, JNL, formerly from Portland. Eugene: UJ has a new three-element beam on 14 Me. La Grande: EJS makes WAS. MEZ and his XYL, NOB, still are in the eastern part of the U. S. Milton-Freewater: MIG has a new 28-Me. beam. GZK is 28.5-Me. mobile. Pendleton: BUS is recovering from a serious operation. The Pendleton Amateur Radio Club is owner of a new 80-348Q receiver. Salem: KWQ has moved to Vancouver. LJO and KGU are mobile on 3.85 Me. Tillamook: GVX is mobile on both 28.5 and 38.5 Me. Portland: OSN, Oregon Slow Net, will meet 3 nights weekly, Monday, Wednesday, and Friday, at 1900 PST until further notice. AJN is new OBS. TVER is a newly-organized group of amateurs interested in AEC activities to cover the Tualatin Valley, which includes the southwestern part of suburban Portland. Aloha, Beaverton, Tigard, Hillsboro, Forest Grove, Gaston, and Timber. Officers are DIS, pres.; OBM,

(Continued on page 70)

IT IS INTERESTING to note the increasing interest lately in the use of noise limiters for C. W. use. Of course, the value of these simple little devices for phone operation has been well established for some time. The usefulness of such a device was brought home quite forcibly to the writer while operating 80 meter C. W. (believe it or not!) at W1WB 1 during the recent field day. The transmitter was a surplus job that left the receiver running while the transmitter was keyed. The head-phones clamped over our ears with huge rubber earlaps that must have been designed for ears much larger. Every time the key was operated, a terrific clatter rattled through our head like a rivet hammer in the subway. We tried removing the phones during transmission but with one hand holding the key on a knee and the other hand operating it, there was too much delay getting rid of the key and getting hold of the phones again. And you know how much time a C. W. man will allow you for such things during Field Day operation! In this instance, a noise limiter would have been worth while just to save wear and tear on the ear drums.

While a single-ended noise limiter with a fixed adjustment is satisfactory for phone operation, it is far from adequate for good noise-limiting with C. W. signals. At National, we recognized this fact years ago and that is the reason that the noise limiter used in the HRO-7 and HRO-50 has for many years been of the double-ended type with an adjustable rather than a fixed threshold.

Phone limiters usually are adjusted to clip the positive modulation swing at about forty per cent with one diode. Further, this adjustment can be made automatic so that this clipping level can be maintained as the signal strength varies. A second diode is not needed to limit the negative modulation swing as this is taken care of by the detector diode itself.

When receiving C. W. signals, conditions are considerably different. The operating level is now usually set not by the signal but by the strength of the injected BFO carrier! If a signal is being received that is many times weaker than the BFO injection, noise peaks can now go to several hundred per cent of the signal voltage in both positive and negative directions. The limiter which worked so well on phone is now almost useless. It is now necessary to clip both sides of the audio signal delivered from the second detector and to adjust the clipping level to match the amount of audio recovered. Only then can good C. W. limiting be obtained. The above is just what the HRO limiter was designed to do years ago. It also helps to keep key clicks from wrecking your ear drums and can be used as a C. W. AVC as mentioned in a recent *QST* article. If you C. W. men have not been using your limiter for these purposes, you haven't been getting the most out of your HRO.

CAL HADLOCK, W1CTW

secy.-treas.; NQB, act. mgr.; and HTX, liaison officer for Sheriff's Reserve. Medford: LNG reports that GLK had the highest score in the recent Field Day activity. HLF reports much interest in mobile radio in this section of the state. Traffic: W7MYI 103, JRU 102, HDN 85, AJN 75, MQ 58, MTW 54, AXJ 51, HV 38, FY 37, DIS 29, OJA 25, GUR 18, LT 18, ESJ 17.

WASHINGTON — SCM, Laurence Sebring, W7CZY — SEC: KAA. RM: JJK. PAM: CKT. KTL is rebuilding the house and reports the Vancouver gang is working on a 28-Mc. mobile net. The VARC had high power on Field Day when its balloon-supported antenna tangled with a 2400-volt power line. MPH is acting as NCS on WARTS. OEB has a daily schedule with his uncle, 6GEU. JJK is trying to keep busy with the farm and at the cannery. KCU makes BPL on originations. EQN is new OO. FIX is working on California routing guide. MPH lands in the Nr. 7 traffic spot for the section. JPH is Nr. 8 this time. ZU took a trip to New York but no mobile gear. ACF, LJM, and the Auburn gang held Field Day on the Reservation and all returned with their scalps. LVB and NWP operated with battery power from Devils Mountain, using Roy's Crosley as a battery charger. CWN says he is not doing much, just a little bowling, fishing, gardening, traffic work, and DX. KAA is keeping the SEC job going in fine shape. The Bremerton gang had bear meat on the menu for Field Day. It looks like they were out for a score with 26 operators turning out. FRU is librarian at two libraries. DDQ has a new 7-Mc. emergency rig. ETO put on the WSNet picnic at Tumwater Recreation Area July 30th. NAE is handling traffic for Bainbridge Island. When you have traffic check into one of the following traffic nets in the section: WSN, 3605 kc., at 1800 PST, Monday through Friday; WARTS, 3970 kc., at 1830, daily; RN7, 3575 kc., at 1845 and 2030 PST, Monday through Saturday. At other times call on 3695 or 3970 kc. Avoid delay by putting your traffic into the right channels. These nets will see that your traffic is delivered in the shortest possible time, as they have schedules with all parts of the U.S.A., and other places with which we can handle traffic. Traffic: W7CZY 1880, JJK 321, KCU 197, IOQ 178, FIX 104, ZU 55, MPH 54, JPH 46, ACF 31, APS 29, ETO 19, KAA 13, DRA 10, LVB 9, CWN 7, FRU 5, KTL 5, LJM 5, NWP 5, DDQ 4.

PACIFIC DIVISION

HAWAII — SCM, Dr. Robert Katsuki, KH6HJ — The 49th State Fair was going full blast early in the month, and Honolulu Radio Parts Co. (RM) had a nice display with a BC-610 occupying the central position. Our RM (BW), our SEC (AS), and our Oahu EC (CM) have let their appointments lapse without proper endorsement, so we're open to suggestions for new appointments. UT and ZG are the present ECs for Maui and Kauai, respectively. Three Field Day messages were received indicating good representation of three of our major islands — Kauai, Maui, and Oahu. Maui produced 15 operators, Oahu 10, and Kauai 6. Through the courtesy of the Hawaiian Electric Co., the HARC has been able to hold its meetings in its Ward St. Building. The Pineapple Net (c.w.) is a thing of the past. Traffic: KH6AN 14.

NEVADA — SCM, Carroll W. Short, jr., W7BVZ — SEC: JU. ECs: LVP, HJ, MBQ, JLV, TJY, KOA, and ZT. RM: PST. OBS: MZP and JLV. The NARA gang were on Field Day from Geiger Summit with 15 operators and 4 AEC members. BVZ and JU copied Armed Forces Day message and also gave K7NAH cooperation the same day during emergency demonstration to the public in Las Vegas. BVZ visited the following while on vacation: 7NIG, TPO, OEL5, OEJ5, UKK, MNU, øWVG, AGY, ACQ, and 5QNQ. JU, KJQ, LGS, LVP, OOG, and TKV were on Field Day for the SNARC. HJ spent two-weeks' military leave working in 6BVY's office in San Diego. CX is active on 7, 14, and 50 Mc., and has new three-element dual 10–20 beam up. Your new SCM would like to hear from anyone interested in ORS, OPS, OBS, or OO appointments. Traffic: (June) W7CX 4. (May) W7JU 28.

SANTA CLARA VALLEY — SCM, Roy E. Pinkham, W6BPT — The SCARRA enjoyed some measure of success in Field Day operation from a location near San Jose. The PAARA worked from Mount Hamilton. The Mission Trail Net held its annual round-up at Coyote with a bigger and better program than in any previous year. NW is handling traffic on a temporary set-up. HC has been busy with the construction of his new QTH. CFK is very busy studying plans for his new QTH. MLY now is in KL7-Land with the CAA. AYL made the BPL handling most of his traffic on 14 Mc. ZIO worked portable while at Camp San Luis Obispo for two-weeks' training with the National Guard. Buster handled lots of traffic for the boys in Camp. ANR is using BC-1306 for portable-mobile. John puts out a nice signal when working portable with a long antenna. JSB is driving the new Studebaker that he brought back from his trip East. AVJ is working at local parts supply house in San Jose during the summer vacation. WGO spent his vacation painting the inside of his house. He also found time to make some changes in his 3.85-Mc. final. His signal has improved now. Reports for this month have been very meager so would like to urge everyone to get his report in early. Traffic: W6AYL 590, BPT 242, HC 50.

EAST BAY — SCM, Horace R. Greer, W6TI — Asst. SCM, Charles P. Henry, 6EJA. SEC: OBJ. RM: FDR. ECs: CX, AKB, EHS, NNS, IT, IDY, QDE, LMZ. DMA is new OBS. TI spent his vacation in Southern California and TT spent his in Oregon. DTW keeps daily schedules with JA2RO, JA2CH, JA2KW, JA2HB, JA2CK, KR6CH, KR6CR, KG6HG, and KH6JG, besides MTN and RN6. CJW has mobile rig going on all bands. JZ keeps schedule with 4PL five nights a week. YDI has 3.85-Me. mobile rig in the car running 36 watts to an 807 final. The whole rig, excluding power supply, is mounted on a 3″ x 5″ x 10″ chassis and fits behind the dash panel. Most of the clubs did much better in Field Day this year than last but they are keeping their scores quiet for the time being. AM passed through on a vacation trip north. PB had a nice trip to Alaska but was glad to get home. Almost every night he kept schedule with CTL. IKQ is glad to be on the air once again. QLH still is QRL flying and night job with NBC mobile. BUY finds a little time each month to have a few QSOs. DUB is QRL work. EJA is knocking over a few new ones. ITH is a busy man these days. MVQ is getting ready for the next DX Contest. LMZ finds time once in a while to get on the air when the fire department does not keep him too busy. IDY is getting to be quite a radio repair man. UZX can be heard often ragchewing with his Dutch friends. QDE had his exciter overhauled. WJX can be heard from time to time. LDD is running around town in his new Chevvie. MEK sure misses his beam. MHB has one good receiver and one poor one. NZ has no TVI problems. CTL is planning to move north soon. KEK is planning on a first-class beam soon. SQ still is QRL work. RCC is busy building boats. GIS has been very active for a change. ZUT keeps blowing up his rig. JK is a super radio and TV salesman but always finds time for QSOs. RRG is keeping Vallejo on the map. OT is doing a good job with schedules and OBS. OBJ still is going strong in emergency work and feels like himself at last. Don't put off until tomorrow what can be done today. Keep that emergency gear in good working order. Disaster never sends a warning. It can strike any place, any time, any hour. Let's be prepared at all times. Traffic: W6JZ 718, DTW 423, YDI 58, TI 2.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — Phone JU 7-5561. SEC: NL. Phone PL 5-6457. The High Frequency and Mobile Society (S.F.) meets the second Friday at the Red Cross Building, 1625 Van Ness Ave. The Humboldt Radio Amateurs Club (Eureka) meets the second and fourth Fridays in the YMCA rooms, rear of Municipal Auditorium, entrance on E St. The Marin Radio Amateurs Club (Kentfield) meets the second Friday in the Engineering Lecture Room, Marin College. The San Francisco Radio Club meets the fourth Friday at the American Legion Hall, 1641 Taraval St. *San Francisco Area:* EC: BYS, URA, vice-president of the SFRC, is building a 2000-volt power supply for his c.w. rig. He also repairs all the soldering irons for the gang, we are informed. GXH has been appointed Official Observer, Class IV, and is to be congratulated on his excellent and active work in this field during the short time of his appointment. The HAMS, with a small membership, made a very fine and efficient Field Day demonstration. CXO, NL, RBQ, and BIP are Official Relay Stations for San Francisco. Give them your traffic. A Route Manager is needed for this area. Any member feeling he possesses the proper qualifications, contacts, and time is requested to contact the SCM. All applications will be given a careful and impartial review. GIH received his Class A license, and was assisted by GXH and FMD in raising an antenna for 3.85 Mc. JWF, Assistant EC for San Francisco, is back from England, after having given a talk on traffic-handling to the Ipswich Radio Club. CHP is San Francisco Emergency Net Control. *Marin Area:* EC: KNZ. All those interested in emergency communications, please contact Ernest, who now is making plans for 160-meter emergency equipment because of the poor results on 28, 50, and 144 Mc. caused by the very rugged and mountainous terrain. News is solicited from Marin County, including the Santa Rose Area, and also from the Ukiah and Willits Area of Mendocino County. *Eureka Area:* EC: SLX. The regular emergency drill of the Humboldt Amateur Radio Club is held every Thursday at 7 P.M. Daylight Time on 29,146 kc. and the HARC invites all to take part. Especially invited are other nearby areas. *Guam Area:* KG6DI made a tremendous traffic total for the month of June. Clark has a traffic total of 5,771 for this 30-day period. A strong move is on foot to request the Governor and the Legislative bodies of the State of California to favorably view a bill to allow all amateur radio operators in this State to have license plates issued using their calls as license numbers, as has been done in Florida. At the proper time, it is asked that all amateurs will write their State Assemblymen and State Senators. Traffic: KG6DI 5771, KG6FAA 256, W6CXO 40, SWP 29, GXH 21, ATO 15, CHP 10, BIP 4, YC 1.

SACRAMENTO VALLEY — SCM, Ronald G. Martin, W6ZF — Asst. SCMs: Northern Area, 6YNM; Central Area, 6CKV; Southern Area, SUP. SEC: KME. ECs:

(*Continued on page 72*)

B&W

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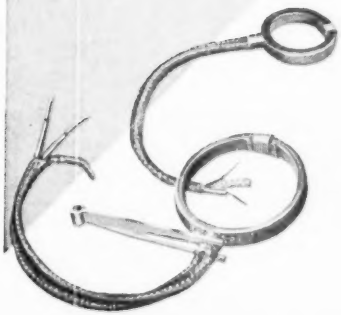

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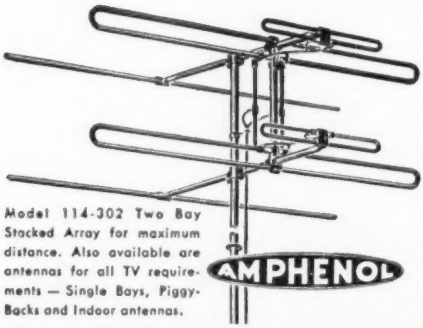

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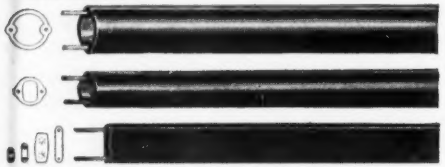

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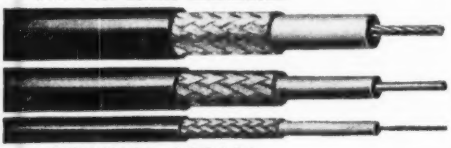

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SAN JOAQUIN VALLEY — SCM, E. Howard Hale, W6FYM — ECs: AJE, CQI, GJO, and HIP. OBS: GRO, EXH, and OHT. OES: PSQ. OO: GRO. OPS: GRO and IEM. EPB, ZKD, and FZR, father, daughter, and son, handled camp-to-home communication for Fresno Boy Scouts during the summer season. MGN ordered vitally-needed medicine for his XYL through FKL, who sent same via stage to Huntington Lake after receiving prescription number, name of druggist, etc. NSK has new rig with 812-A final. EQO makes the eighth station in Turlock on 144 Mc. GJO and HIP are new EC's for San Joaquin County and City of Stockton, respectively. Bakersfield, Fresno, Turlock, and Stockton Clubs were all active on Field Day. PJF was active during Field Day as a single entry from Camp Connell in Calaveras County. PSQ is working to fulfill his ambition of rigs on all bands up to and including 10,000 Mc. BCL and FYM apparently were high scorers for the section in the last VHF Contest. S.J.V. section c.w. net should be well under way by the time this appears in print, so if you wish to check in listen on 3745 kc. Monday through Friday at 7:30 P.M. LRQ and GS report that the Bakersfield Club is going strong. GRO has added emergency equipment to his set-up. VPV got himself hitched. MVK, of Los Angeles, recently visited the SCM and is attempting to organize v.h.f. activities in the northern and southern parts of the State. Please keep the monthly reports coming, gang, we appreciate it. Traffic: W6GRO 65, EXH 14, FYM 13, GQZ 2, NSK 2.

ROANOKE DIVISION

SOUTH CAROLINA — SCM, Wade H. Holland, W4AZT — The Palmetto Amateur Radio Club of Columbia operated four transmitters in Field Day as MN. The Greenville Amateur Radio Club had three c.w. transmitters and ten operators under the call KZ in Field Day. The Charleston Radio Club operated one transmitter with less than thirty watts under the call HHO for Field Day, plus individual Field Day stations operated by BIZ, IZD, ANK, OWW, LIK, DFC, and K4USN. GCW was active in Field Day from Glassy Mountain. ANK sends the following information from Charleston: HTR is f.m. on 28 Mc.; NRC is on 7 and 28 Mc.; LIK is mobile on 28 and 50 Mc.; OWW also is mobile 28 and 144 Mc. HHB is portable in Charleston on 28 Mc. and 5KTF and 4DNR were visitors to Charleston. The Charleston Club is working on plans for a hamfest before Labor Day. KZ became Class I Observer with an accuracy of .00682 in frequency measurements. CMP and BEN are active on 50 Mc. NZF now has 10-meter beam. We would like to welcome JNL, formerly of Savannah, Ga., to Columbia. All Field Day stations had nice publicity in the local papers concerning activity and the Charleston Club had almost half a page. Most all of the papers in the State welcome news of ham activity and we think they should be contacted on all unusual operation. Traffic: W4ANK 98, AZT 27.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Our retiring SCM, KFC, closed his final report last month with much praise of and thanks to the gang, and through this column we acknowledge with emphatic thanks his sharing with us of a splendid personality and leadership which has

(*Continued on page 74*)

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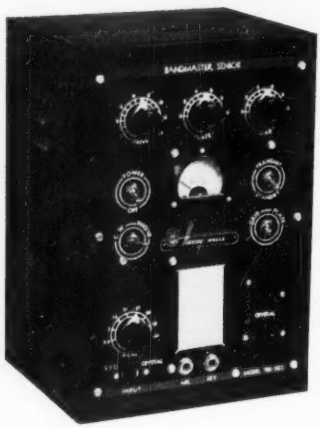

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kept Virginia in the front line of activities. IA and KFC have consented to "carry on" temporarily with the *VN Bulletin*. Field Day activities brought out the gang in large numbers. The Virginia membership of PVRC was well represented during Field Day at Fort George Meade, Md., 3USA/3, by CC, FF, IA, JUY, KFC, KFT, KVM, LRI MOJ, RH, and VE. IWO got lost in the grounds and showed up 30 minutes before QRT. Thanks go to Lt. Richardson, 3NHB, officer in charge of 3USA for auxiliary power, cots, and quarters, and to his XYL for cooling refreshments. Field Day activities of the Falls Church Radio Club, 4PAY/4, at the Fire Tower Pender, Va., turned in a good accounting. MSL/4's Field Day QTH was Chantilly, Va. Other known club participants were ZV (Richmond Radio Club), PED (Lynchburg Radio Club), NRO (Norfolk). The Capital Mike and Key Radio Club slipped across the Potomac from Washington, D. C., as 3DIM/4. NNX, proxy of PVRC vacationing in Iowa operating portable, snagged quite a few during Field Day. NQV, 15-year-old young squirt from near Annandale, took top honors in the recent model airplane meet at Andrews Air Force Base. FV stopped long enough from house-building for a few Field Day QSOs. 1OJM/4 recently purchased a 100-acre farm in Louisa County. Rumor has it that another antenna farm is being born with a 40-meter beam in the plan. KP4KK is operating portable in Norfolk awaiting modification. Your new SCM solicits your reports on activities. Traffic: (June) W4KFC 23, MLH 12, CVO 8, IA 4. (May) W4IA 25.

WEST VIRGINIA — SCM, Donald B. Morris, W8JM — For the second straight year MARA members left Field Day to go to a flooded area, this time near West Union, where EC traffic was handled while communications were out. DFC and BTV continue to handle traffic through the summer heat. BOK and JM visited BWI at Spencer. PZT was isolated during the flood and water got into his radio shack. KVARA, with two transmitters and ten operators, reports a successful Field Day. CLX controls his high-powered rig from the operating point, two miles from the transmitter. GBF finds DX interesting on 14-Mc. c.w. The following stations were heard during the flood emergency handling traffic and doing a swell job: AUJ, AVW, BTV, BWK, CLX, CSF, CSF/8, EZR, FMU, BWI, CNF, GBF, KWI, PQQ, and VAB. Ex-HSA visited West Virginia amateurs while on vacation. FMU is recovering from a recent illness and is active on 7-Mc. c.w. DHT is changing to 813s on his 28-Mc. 'phone rig. WSL and JM are sweating out DXCC confirmations. CKW is home from school and is active on all bands, 160 through 10 meters. West Virginia still needs OBS and OO appointees. Your applications will be appreciated. Traffic: W8BTV 269, CKW 34, DFC 7.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, M. W. Mitchell, WØIQZ — SEC: KHQ. RMs: LZY and ZJO. ZJO makes BPL again this month with a total of 838. MOM had a daily schedule with AJJ/Ø, who was operating at National Guard Camp. They handled 67 messages, 9 of which were press. The newspaper and b.c. station KLMR were very glad to handle this news. Part of the time AJJ/Ø operated from a jeep. A new station at Lamar is KØWAR. MHR and ULZ report that BJU is a new ham in Greeley. He is an engineer at KFKA. KHQ reports the Colorado Emergency Net still is functioning but attendance has dropped off considerably because of QRN and summer activities other than ham radio. He still is working on the new rig and now has the exciter working FB, but is having back-order QRM. ULZ is back on with a half gallon. TW/Ø, FRE, and AAB/Ø were active in Field Day operating. The Denver Radio Club, with the call TW/Ø, operated in the vicinity of Cherry Creek Dam just outside of Denver. Emergency power was used with a total of 30 operators. AAB/Ø operated one mile east of Littleton with six operators. FRE/Ø operated outside the city limits of Grand Junction with 7 operators. AGU and 5CEE visited yours truly. IQZ visited SRX and MMQ in Yankton, S. Dak., and 5CEE in Hobbs, N. Mex. The new exciter is coming along fine. The Clapp oscillator is finished and tests show 100 cycles drift from cold start to full warm up! Traffic: WØZJO 838, MOM 100, MHR 8, KHQ 2, LZY 1.

UTAH — SCM, Leonard F. Zimmerman, W7SP — LAB, the Ogden Radio Club, was on the air for Field Day at the Ogden General Depot with nine operators. LRA, Utah Amateur Radio Club, was located at the Salt Lake Air Base with about thirty operators participating. There was not as much wind as usual but it was chilly by morning and the place resembled an Indian camp, as all the fellows had blankets thrown over their shoulders. OOK now is being heard on 14-Mc. 'phone. What is the matter, Natalie, did you break your bug? KUX is the call of an OT from Montana who has moved to Salt Lake City. Welcome to Utah, Erwin. JVA again is being heard on the air after a long illness. We wish you a speedy and complete recovery, Doc. Where are the traffic reports?

WYOMING — SCM, Marion R. Neary, W7KFV — MVK, HNI, and KFV attended the hamfest at North Platte, Nebraska. 144-Mc. is showing good prospects around Laramie, with contacts over the mountains into OWZ, at Cheyenne, and ØELL, at Denver. ØNGM stopped in to see JGS and KFV on his way to W6-Land. The Field

(Continued on page 78)

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Day location of JDB near Laramie on U. S. Highway 30 at its highest point, 9000 ft., proved quite interesting with 3.85-Mc. 'phones from W6- and W9-Land rolling in at 0900. Easier to hear than to work, however. BJS moved from Riverton to Laramie and is operating 3.85-Mc. 'phone. GZG and PGS are looking for DX on 14 Mc. Wyoming's leading traffic man, DXV, is temporarily shut down with the coming of the summer season and this winter will be operating 28.5-Mc. 'phone on the high seas. We'll miss those traffic reports. Traffic: W7DXV 38, OWZ 9.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Leland W. Smith, 'W4YE — Congratulations to the Anniston Radio Club for a swell hamfest at Oxford Lake. REK, our country doctor, is turning in some fine DX reports. CIU reports that RBJ is the only active ham in Jasper. HAN is pounding brass on 7 Mc. ADJ is working 28-Mc. 'phone regularly. MVM had bad luck with his new transmitter and is starting all over again. KUX finally got back on and can be heard on 144 Mc. KCQ has converted the ham shack into a photographic lab. Officers of the newly-organized Tuscaloosa Club are ELX, pres.; MAB, vice-pres.; IMK, secy.-treas. The Montgomery Club is QRT for the summer. HFL is putting in 105 hours on the job and still finds time to work 4 Mc. IAT and NXX are active on 28 Mc. BCU gets out as well from his "vacation special" as he does from the home shack. DAQ has new Collins 75-A receiver. PYX is a new ham in Concord. DFE burned out his plate transformer. K4FAG has left Craig Field for parts unknown. EWN has migrated to Macon, Ga. OXW is back in Mobile. SLJ is working out swell on 56 Mc. GDU truly modulates his BC-696 with four '46s. Traffic: W4BFM 10, CYC 10, YE 9, REK 8, ATF 4.

EASTERN FLORIDA — SCM, John W. Hollister, W4FWZ — Field Day went over with a bang, from reports received. Jacksonville, Miami, West Palm Beach, Orlando, and Clearwater reports showed that plenty of diversified equipment was used. The mobiles had a big day. Congratulations to all participants. The Gator has a new RM — OZC succeeds MNT. Please mail your reports to the SCM not later than the second day of each month. Here is something to grab on, you 28-Mc. 'phone men: A group in Jacksonville is starting an emergency net. So far FS, PJW, PMZ, NMG, PUW, HWA, POZ, IBQ, RBU, and OBB are attending drills and it is desired to make it state-wide. (AKF, please note because you were interested in this a long time ago). LJM is new MO for K. of Kc. and JEP is the SA. HUY, the retiring net MO, did a swell job. Key West: OLA is using a Telvar with Meissner Signal Shifter for a nice 60 watts on 7, 14, and 28 Mc. His receiver is an NC-240D. A folded dipole is used. New Port Richey: KJ says IQV got his mike back so it is safe to let him visit you now (even at HUY's)! Oakland: OCG really is working hard for the Gator Net. He schedules PL and 3CUL and needs outlets in Florida. Punta Gorda: AFO and OGI were at the National Boy Scout Jamboree. Al and his son are quite active in this worthy work. Well, fellows, it's time for the Palmetto Net to get started on 3675 kc. Drop me a card for the dope because the Net will need help from all operators, slow or fast, new or OTs. There will be plenty of traffic to move again this season. Write ARRL for National Traffic System information. Come on, gang, let's support these net activities. Traffic: W4JEP 73, KJ 35, OCG 22, OGI 18, FWZ 8, OLA 1.

WESTERN FLORIDA — SCM, S. M. Douglas, jr., W4ACB — If there is any question in your mind as to where these monthly reports are, ask yourself if you sent the SCM a report on your activities. With Field Day behind us we should look toward getting our emergency gear polished up and in a stand-by status, as the hurricane season approaches. Please advise the SCM of your plans, gear, etc. ROM, of Crestview, is our newest ham. IPV visited AXP and they kept the rig hot at Warrington. PAA has new HT-B9. QGH is working lots of DX with his 14-Mc. beam. AXP reports working some DX also. OCL, GAA, GQM, NAY, ACB, IQN, NQY, QB, and EIO were among the operators on Field Day. They were set up at Silver Lake, near Tallahassee. OYR and QB took their exams in Tallahassee recently. ACB has the 50-Mc. rig finished. TL keeps busy at the CAA office. IQN and DUE are new hams in Tallahassee. Traffic: W4AXP 1.

GEORGIA — SCM, James P. Born, jr., W4ZD — The Cracker Emergency Net held its annual meeting June 18th at Lithia Springs in connection with the Kennehoochee Radio Club's Hamfest. LXE was reëlected NCS. NTK was elected South Alternate NCS and FVY North Alternate NCS. PBF was elected secy.-treas. MMB is the new SEC for Georgia. The following are new ECs: KXT for Cobb County, NLY for Dougherty County, and HZG for Fulton and Dekalb Counties. PFA, IMQ, and KWC are new ORS. KWC now is an OO with new frequency checking equipment. QEF, Lanier Senior High School, is active on 14 Mc. and 28-Mc. 'phone. PFA has new 14- and 28-Mc. beams on a 70-ft. pole. PER and PZD are active in Macon. RPO is a new ham in Dallas. HGD is doing OK on 3.5-Mc. 'phone with 7.5 watts. AQL, Georgia Tech. Radio Club, handled traffic for visitors during "Engineers Week" at Georgia Tech. The Club operated two radio circuits between

(Continued on page 78)

"Again I Enjoy Operating During TV Hours"

June 28, 1950

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the field house and the main club station. These circuits, duplex on 144 and 27 Mc., were used to relay messages to the main station for retransmission on 14, 7, 3.5, and 3.85 Mc., 'phone and c.w. A total of 147 messages were handled. The Atlanta Radio Club now holds two meetings a month, the regular meeting the first Thursday, and bull session and swap shop the third Tuesday. Field Day messages were received from BOL, GSY, and MQN. 30IC, 2BFK, LQO, IMO, and LJC are operators at AQL and are doing an excellent job of traffic handling. Traffic: W4MCM 158, AQL 147, IMQ 4, ZD 4.

WEST INDIES — SCM, Everett Mayer, KP4KD — PRARC and BARC jumped into Field Day with both feet but BARC got rained out. UW is building 1-kw. PA. He schedules W8CZR. PRARC staged a simulated emergency. Participants were ID, CB, HZ, AK, DJ, KD, and mobiles DV, FF, and JM. W2JYH was a visitor to KP4. AJ is new OBS at Ramey. JM made the grade on Class A, as did IG. KZ registered in the AEC. The PRARC Board plans "On The Air" meetings the 1st and 3rd Tuesdays of the month. MG sports 150-watt Temco rig at Ramey. LH has the most tubes per watt, SCR-522 conversion 20 tubes 10 watts out. KQ has 829B in "constant modulation" system. MD is active on 3.5, 7, and 14 Mc. and ME is heard on 7 Mc. DJ reports c.w. AEC net well attended while 'phone AEC net attendance is poor. IF made a trip to Ramey to give exams to prospectives there. DV works hard at getting out PRARC *Ground Wave*. Traffic: KP4DJ 22, KD 21, AK 10, KO 10.

CANAL ZONE — SCM, Everett R. Kimmel, KZ5AW — Atlantic and Pacific Emergency Nets combined to put KZ5KZ/KZ5 on the air at Gamboa for ARRL Field Day. Directed by NM, PA, RM, and WJ, more than thirty KZ5s labored to make the first Canal Zone Field Day a very satisfactory activity. The operating shack and much material aid came from GM and WA. In the hills at Cocoli under a bit of canvas, ES and GT staged a separate two-man Field Day which developed into a battle with rain, QRM, and sandflies. Moths plagued the night operators at KZ5KZ/KZ5. Next month MN and PA plan a Field Day for the Atlantic Side. The 28-Mc. 'phone watch now is listed with ARRL as a regular 'phone net with members entitled to net certificates. Apply to WJ for yours. RM PA wants all 14-Mc. c.w. schedules listed with him for future traffic routing. RB and WJ are building half gallons. Traffic: KZ5NM 169, PA 58, LR 18, GD 17, KZ 3.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Virge A. Gentry, jr., W6VIM — SEC: WOU, PAM: MVK, RMs: CE, CMN, DDE, FYW, IOX, and LDR. The Southwestern Division Convention will be held in Santa Barbara at the Mar Monte Hotel, Sept. 9th. The price is $4.00 per ticket. Let's all plan to attend so that we can show the Arizona and San Diego sections that we in the Los Angeles section are good hosts and can put on a real convention. Let's decorate our automobiles so that the people of Santa Barbara will know that we are having a convention. I'll see you there. WOU was appointed SEC, replacing ESR, who was forced to resign because of business. ZVD was appointed EC in charge of the Long Beach AEC. The former EC, AOT, had to resign for business reasons. GYH has been keeping schedules on 7 Mc. with KR6CA since January of this year. The following received OPS appointments: ANT, HLZ, and QLM. QLM and NAZ are the only YLs holding appointments in the section. OKL's new QTH is 9445 Jenny Ave., Los Angeles 45. BUK rebuilt his speech amplifier. QE and HYS were portable at Barton Flats in the San Bernardino Mountains in June. COZ, in Pomona, took traffic from them. The traffic originated from the Campfire Girl's camp located in the Barton Flats Area. The Tri-County Amateur Radio Association announces new officers as follows: GAE, pres.; COZ, vice-pres.; SW, secy.-treas. BHG had his Collins 32V-1 modified to 32V-2. YVJ has a new jr. operator. ZOJ's best Field Day DX was Haiti. DDE, FDR, YSK, and WT and his XYL visited FYW. ISQ has a new 500-watt final. DLR is jarring the bands with his new 250TH final. Field Day station VB/6 used GTF's 420-Mc. gear and contacted the following: ABN, CFC, CFL, GAL, NLZ, NXN, and QOE. The best DX was 30 miles. HPT was transferred to Germany in July. He has 125 watts on the air in Germany. Let's keep an ear open for Don. All XYLs and SWLs in the Southwest and Harbor Area of Los Angeles are urged to sign up for an adult evening school class in code this fall at the Redondo Union High School. Anyone interested may contact ETL at 853 Eighth St., Manhattan Beach. YSK handles traffic on 1.9 Mc. MVK is sponsoring three state-wide v.h.f. contests. The contests start Sept. 1st. The attributes of each contest will be trophies donated by MVK. All v.h.f. enthusiasts are urged to contact WKO for rules and other details. WKO is the contest chairman for the Los Angeles section. His address is 5308 Third Ave., Los Angeles. Your SCM has had the displeasure of being forced to cancel a large number of station appointments because of the appointees' failure to submit regular monthly station activity reports and certificates for endorsement when they are due. If an appointee is forced to an inactive status, it is better for him to request temporary cancellation than to receive

(*Continued on page 80*)

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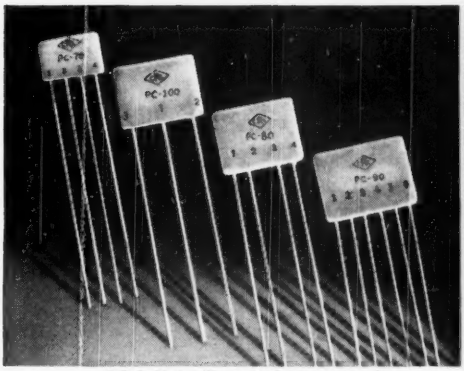

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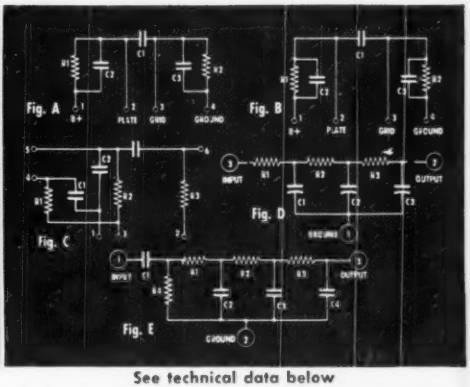

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P.E.C. TRIODE COUPLATES

A Triode Couplate is a combination of three capacitors and two resistors bonded to a ceramic plate, connected by metallic silver paths fired to the base plate. It easily replaces the following components normally used in audio circuits when one tube is coupled to the grid of a following stage: Plate load resistor, grid resistor, coupling capacitor, plate r.f. bypass capacitor.

MIDGET No. 2 TRIODE COUPLATES

SIZE — $1\frac{3}{16}$" x $\frac{9}{16}$" x $\frac{5}{32}$" thick.
LEADS — No. 24 tinned copper, $2\frac{1}{2}$" long.
CAPACITOR RATINGS — 450 volts d.c. working, 800 v.d.c. flash test. Tolerances, .005 mfd. +80% −20%; 250 mmf. ±40%.
RESISTOR RATINGS — Tolerance ±20%, ½ watt.

CAT. NO.	TYPE	CONSISTING OF (Diagram A)
PC-70	MIDGET #2 COUPLATE	C1 = .005 mfd. C2 and C3 = 250 mmf. R1 = 500,000 ohms. R2 = 500,000 ohms.
PC-71	MIDGET #2 COUPLATE	C1 = .005 mfd. C2 and C3 = 250 mmf. R1 = 250,000 ohms. R2 = 500,000 ohms.

STANDARD TRIODE COUPLATES (High Capacity)

SIZE — $1\frac{3}{32}$" x $1\frac{3}{16}$" x $\frac{3}{64}$" thick.
LEADS — No. 22 tinned copper, $2\frac{1}{2}$" long.
CAPACITOR RATINGS —450 volts, d.c. working, 800 v.d.c. flash test. Tolerances, .01 mfd. +80% −20%; 250 mmf. +50% −20%.
RESISTOR RATINGS — Tolerance ±20%, ½ watt.

CAT. NO.	TYPE	CONSISTING OF (Diagram B)
PC-80	STANDARD COUPLATE	C1 = .01 mfd. C2 and C3 = 250 mmf. R1 = 500,000 ohms. R2 = 500,000 ohms.
PC-81	STANDARD COUPLATE	C1 = .01 mfd. C2 and C3 = 250 mmf. R1 = 250,000 ohms. R2 = 500,000 mmf.

P.E.C. PENTODE COUPLATES

A Pentode Couplate replaces the following components normally used in audio circuits when one tube is coupled to the grid of a following stage: screen resistor, plate resistor, grid resistor, screen bypass capacitor, plate r.f. bypass capacitor, coupling capacitor.

SIZE — $1\frac{17}{64}$" x $\frac{7}{8}$" x .045" thick.
LEADS — No. 24 tinned copper, $2\frac{1}{2}$" long.
CAPACITOR RATINGS — 450 volts d.c. working, 800 v.d.c flash test. Tolerances, .005 mfd. GMV; 2000 mmf. and 100 mmf. +50% −20%; 50 mmf. ±20%.
RESISTOR RATINGS — Tolerance ±20%, ½ watt.

CAT. NO.	TYPE	CONSISTING OF (Diagram C)
PC-90	PENTODE COUPLATE	C1 = .005 mfd. C2 = 50 mmf. C3 = 2000 mmf. R1 = 4.7 megohms. R2 = 1 megohm. R3 = 2.2 megohms.
PC-91	PENTODE COUPLATE	C1 = .005 mfd. C2 = 100 mmf. C3 = .005 mfd. R1 = 4.7 megohms. R2 = 1 megohm. R3 = 2.2 megohms.

P.E.C. VERTICAL INTEGRATOR PLATES

P.E.C. Vertical Integrator Plates are widely used in television vertical integrator networks. Two forms are available — see wiring diagrams D and E. Each has only three external leads.

SIZE — Cat. No. PC-100, $1\frac{3}{32}$" x $1\frac{3}{16}$" x $\frac{1}{8}$" thick. Cat. No. PC-101, $1\frac{3}{16}$" x $1\frac{1}{16}$" x $\frac{3}{16}$" thick.
LEADS — No. 22 tinned copper, $2\frac{1}{2}$" long.
CAPACITOR RATINGS — 450 volts d.c. working, 800 v.d.c. flash test. Tolerances, +50% −20%.
RESISTOR RATINGS — Tolerance ±20%, ½ watt.

CAT. NO.	TYPE	SEE DWG.	CONSISTING OF
PC-100	VERTICAL INTEGRATOR	D	C1 = .002 mfd. C2 = .005 mfd. C3 = .005 mfd. R1 = 22000 ohms. R2 = 8200 ohms. R3 = 8200 ohms.
PC-101	VERTICAL INTEGRATOR	E	C1 = .01 mfd. C2 = .002 mfd. C3 = .005 mfd. C4 = .005 mfd. R1 = 22000 ohms. R2 = 8200 ohms. R3 = 8200 ohms. R4 = 22000 ohms.

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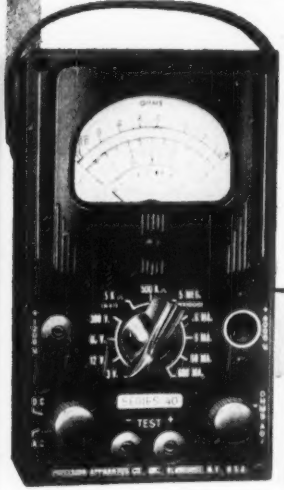

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forced cancellation. ESR and VIM visited the Two Meters and Down Club and the Associated Radio Amateurs of Long Beach. LS supplied GAL's Field Day radio teletypewriter. Traffic: (June) W6CE 732, GAL 6 594, LDR 281, GYH 176, ANT 112, CMN 94, BHG 41, ISQ 21, COZ 19, MU 14, YSK 14, FMG 4, ASW 2. (May) W6ISQ 26, YSK 24.

ARIZONA — SCM, Jim Kennedy, W7MID — New Officers of the Winslow Club are LYS, pres.; NAI, vice-pres.; KQV, secy. OJQ, REO, LYS, NAI and KRA are on 160 meters. New calls in Winslow are OJQ and APE. Old Pueblo Club election results are LVR, pres.; LPK, vice-pres.; LZF, secy.-treas. A new ham in Tucson on 144 Mc. is OQX. New Class B hams in Tucson are NNO, NNT, NPW, and NSJ. 420-Mc. activity there increases as UPF, KFS, UOG, FGG, SLO, OWX, and MAW get on. KFS, NSJ, NNO, and NNT served as operators in recent forest fire emergency. EIE, ex-4MOC, is a new call at KGAN, Kingman. 5RDB/7 has unusual dual conversion receiver, with crystal mixers, perking. Officers in RCA in Phoenix are OIF, pres.; JOK, vice-pres.; RIJ, secy.; KUZ, treas. Another new club in Phoenix is the Central Arizona group, who worked 123 stations on Field Day on 28 Mc. with just 18 watts. Naval Reserve stations in Arizona monitor 7200 kc. constantly. For a free TV service lesson, tune in JLW on 14-Mc. 'phone, fixing 4AQR's set! New SEC for Arizona is OIF. New Mesa call is OPS. NPA, from Salt Lake City, is another Mesa call. LHM has new five-element 28-Mc. rotary. KRW is on 144 Mc., QJL on 160 meters. Traffic: W7MOW 30.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, Joe G. Buch, W5CDU — Field Day activities were plentiful and successful judging from the reports that have been received. From all indications, the number of mobile and emergency-powered fixed transmitters have increased considerably in the past year. The Northern Texas gang had a preview on June 9-10-11 at Possum Kingdom. Several mobile and portable units were in operation and the following hams attended: FZB, HPG, JOG, LWZ, QBY, FTK, JSS, AFI, MQH, LTP, BBH, OFN, RBV, HRN, JHI, KZC, APW, CC, JDZ, GYW, and HCH. CJJ and his associates were busy on Field Day using the Dallas Club call, FC. The Abilene Club set up near Buffalo Gap for Field Day operation. The East Texas gang had a combination Field Day and hamfest at Bonham State Park. LUD had a rig working 7 Mc.; ATG worked 3.85 Mc.; and RJM set up on the 30-Mc. band. Amateurs attending were QYN, QEW, RDH, KUP, PST, MJN, LGY, GZU, PVH, DRV, ATG, QFK, KUC, LUD, RJM, CDX, NY, KVV, CTM, OBI, ex-AZQ, and ex-KVE. EN was set up at Burn's Run and operators were EN, OLD, IXV, OGS, and PRN. HI is recovering from a serious illness. AJA, CMS, and MTL made 140 contacts on Field Day using 3.85-Mc. 'phone, plus 3.5-, 7-, and 14-Mc. c.w., using the call AJA. MTL says they learned a lot and made plans for a better set-up next Field Day. Transmitters used were converted 274N units. HCH operated from Lover's Retreat on Field Day. Traffic: W5GZU 87, BKH 56, ARK 51, LGY 13, ASA 7.

OKLAHOMA — SCM, Frank E. Fisher, W5AHT/AST — SEC: AGM, RM: OWV, PAM: ATJ. Enid's ham population is up two with REC and ROL receiving their tickets. Both started right with memberships in ERC and ARRL. 3HZY, Chief of Staff, Telecommunications of the Department of State, visited his father, 5EZK, and spoke to the Enid Amateur Radio Club. EHC has been absent on military duty. HEV has added a pair of 805s as linear amplifier to his s.s.s.c. rig. The Emergency Corps continues to grow, jumping from a total of 98 to 116 members this month. Are you a member? MBV has moved to his new home in the east. He will be on as a W3 as soon as he gets settled. PA is on a well-earned vacation, as is OWV. OQD now is ORS. A. & M. Radio Club, Ardmore. Bartlesville, Enid, Holdenville, Oklahoma City, Ponca City, and Tulsa were among the Oklahoma clubs participating in Field Day activities. Your SCM worked a trick or two with the Bartlesville Club and was happy to observe such activity as was evident throughout the state. OLZ went on an abbreviated schedule of Monday, Wednesday, Friday, and Saturday because of a shortage of help. Don't let that 80-meter rig get rusty during the summer QRN. It's not as bad as you think and you might need the experience in copying through heavy atmospherics. Attendance in the 'phone net has been excellent. QRN does not seem to be so bad in the morning hours. How about some news, fellows? Traffic: K5NRJ 353, K5WAH 151, W5OYP 95, FOM 85; OQD 34, AHT 27, EHC 3.

SOUTHERN TEXAS — SCM, Ammon O. Young W5BDI — MN is using an isolation transformer which he has built. ACL has a telephone pole and a rotator — now to get them installed. IYR has new HRO-50. MIF has a new XYL and a new home — he also is working on a new rig. ABQ is NCS for STEN c.w. net. JGT is QRP for the present. NXD is NCS for STEN. NMA, OFM, and LXY are on 14-Mc. 'phone. Traffic: W5MN 418, ABQ/AFZ 20.

NEW MEXICO — SCM, Lawrence R. Walsh, W5SMA — SEC: BYA, RM: ZU, PAM: BIW, PAM v.h.f.: FAG. All activity in June could be listed as "Operation Field

(Continued on page 82)

The CARDAX

World's favorite premium crystal mike—the only high level crystal cardioid with dual frequency response. Lists at $39.50.

The "630" DYNAMIC

Very popular super-dynamic. Ideal frequency response. High output. Acoustalloy disphragm. Lists at $36.50.

The MERCURY

Rugged, handsome Crystal or Dynamic. Extra quality features at minimum cost. List prices from $22.50 to $31.00.

FAVORITES for Clear QSO's

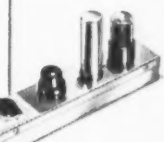
A roll call of Hams proves the popularity of E-V mikes. That's because E-V engineered response assures *clear, exact* voice reproduction... E-V high output provides more power! There's a model made for you in the complete E-V line—with all the *extra* quality, *extra* features, *extra* value you want! *Ask your E-V Distributor or write for Bulletin No. 104.*

The CENTURY

Low-cost all-purpose crystal and dynamic models. Rugged, dependable. Satin chromium finish. Lists at $10.00 and up.

TOUCH-TO-TALK

First to fit any mike with ⅝"-27 stand coupler. Finger-tip relay operation or microphone "On-Off." With or without mike.



SPEECH CLIPPER

Clips the peaks from speech frequencies which exceed a pre-set amplitude. Adds greatly to articulation and intelligibility in speech transmission, especially in the presence of high QRM or QRN. Holds modulation at 100%. With tubes. Lists at $24.50.

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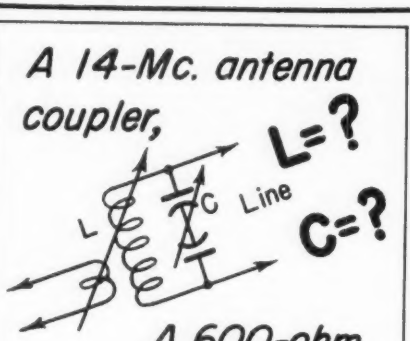
Export: 13 East 40th St., New York 16, N. Y.

Cables: Arlab



How much inductance should you use? How much capacity? If the power is 500 watts, what's the voltage across the line terminals?

Tough questions, perhaps. But it's easy to figure out the answers when you know how —and it's easy to learn how.

Here's a booklet that carries you through the whole subject of radio communication. From the fundamentals of electricity and magnetism through a discussion of transmission line, A COURSE IN RADIO FUNDAMENTALS is written clearly, simply, thoroughly, for home study in connection with the Radio Amateur's Handbook.

Each of its eight parts treats a specific radio subject such as Resonant Circuits (Part Three), Modulation and Keying (Part Six), and includes assignments to study and experiments to perform. The WHY is in the thirty-three interesting assignments with their problems and answers. Forty fascinating experiments let you find the HOW for yourself.

You can really learn radio through

A COURSE IN RADIO FUNDAMENTALS

50¢

Answers to problems above (Part 8, assignment 33, question 16): .68ah, 190, μfd, total, 380μfd, each section of condenser in diagram, 547 volts.

When ordering, please don't send stamps in payment

AMERICAN RADIO RELAY LEAGUE

30 LaSalle Rd. West Hartford 7, Conn.

Day." The following clubs or groups were active: Los Alamos Club, 510 contacts, 4170 points; Sandia Radio Club, 415 contacts, 3729 points; Santa Fe Radio Club, 300 contacts (approx.); Sierra Amateur Radio Assn., 146 contacts, 1584 points; Messilla Valley Radio Club, 135 contacts, 930 points; Los Alamos group; Four Corners Radio Club; Tijeras group; and the Roswell group. ZU operated as a mobile station on 3.5, 3.85, and 28 Mc. VWU, Albuquerque, is working on 50 Mc. and reports hearing FAG on 144 Mc. ISW, in Hobbs, now is on 28-Mc. 'phone. FAG is putting up a new v.h.f. tower (70 ft.) and building a new receiver for 144 Mc. SE now is at Shiprock, N. Mex. NRP/2 can now be reached via K2USA, Ft. Monmouth, N. J. MSG and KAO again have qualified as Class I Official Observers. Ed had an average error of 24.9 parts per million, while Dolph had an average error of 41.7 parts per million. QNQ now has 40 watts on 7 Mc. BIW, our PAM, has been nominated as Alternate Director of the West Gulf Division. Traffic: W5PLK 12, SMA 10, NJR 5, QNQ 2.

CANADA

MARITIME DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ. KS has been using 2" 'scope and reports a recent visit from DZ. SH and GH are operating mobile with ATR-5s and rebuilding their "big" rigs. ES is 14-Mc. ragchewing mostly. This year's Field Day was a great success with reports from FO/1, GF/1, CV/1, AM/1, NZ/1, and VO6H. OC is back using a Harvey-Wells. PL is a new man on 7 Mc. with Command transmitter with about 50 watts input. WL is finishing bandswitching rig. TA has a nice-sounding mobile 28-Mc. 'phone going — it's not n.f.m. either. Many thanks to EV for the following news re the Moncton boys: GF recently did some repair work on the beam. GN was chairman of Field Day activities of RC. UT is working 3.5-Mc. c.w. with about 20 watts. ABI is on 3.5-Mc. c.w. with 100 watts to 807s and an 1155 receiver. YM is holding forth on 3.8 Mc. and experimenting with antennas. TZ is working 14-Mc. 'phone. CX has a new rig with 807s and 3.8-Mc. Zepp. EL has an 813 in the business end of his new rig — 150 watts and bandswitching. YU was transferred to Churchill and will be on 7 Mc. AHQ is on 14-Mc. c.w. when not QRL work. LZ/1 and DQ/1 finally got that long-talked-about contact on 3.8-Mc. 'phone. Traffic: VE1MK 26, FQ 22.

ONTARIO DIVISION

ONTARIO — SCM, Thomas Hunter, jr., VE3CP — Asst. SCM c.w., W. Guillot, 3BUR. SEC: KM. RMs: ATR, AWE, BMG, BUR, DU, GI, IA, TM, WK, and WY. PAMs: BSA, DF, and FQ. BJE edits *Break-In* for the Kirkland Lake Club and is doing an FB job; the monthly can be had for 75¢ a year. ANH is on with a new rig. ALT is using p.p. 304s. BNQ has now worked 124 countries. ALT won $1000 in a raffle or something and we would like to know how. Congrats to the Queen's Club of Kingston for winning the $1500 *Radio News* contest. KM is trying out 28 Mc. DKE is a newcomer to Windsor. ABP has 90 confirmed countries. W6HAU visited CP and AIU and several other of her 28-Mc. friends in Ontario. CAQ is NCS for the 28-Mc. net. BIB is EC for Peterborough. ADN is on 3.8 Mc. with higher power. IE has left Windsor for Chatham. EAM is the newest member of QON. Not many reports this month and this is my last as SCM. It certainly was good working with all of you and your support and cooperation sure was appreciated. Your new SCM for the next two years will be G. E. Farquhar, IA, 60 Wellington Ave., Burlington. I know Eric will go a good job and that you will give him the same support that I have received. His job is no easy task but it will be made a lot easier if all of you will get your monthly reports in to him by the first of each month. Traffic: (June) VE3IA 215, DDU 132, YJ 92, IL 88, WK 75, BL 40, RL 36, CP 34, YS 33, ADN 29, HK 17. (May) VE3AZH 126.

QUEBEC DIVISION

QUEBEC — SCM, Gordon A. Lynn, VE2GL — June was a month of quite heavy traffic with Quebec and District Emergency Net on 3800 kc. handling traffic with Rimouski and Cabano during fire disasters at those points. TA copied over 3000 words of press and more than 300 messages from Winnipeg during the flood emergency. ZF continues to schedule the Baird Expedition and will accept any traffic offering for them. PQN has discontinued regular activities for the summer and by the time this appears will be getting geared for fall and winter activities. All VE2s are invited to participate in this net on 3570 kc. at 7 P.M. EC schedules ZG, AT, AIM, ABJ, ABB, VE, KY, VI, and PV on 144.6 Mc. ABJ and ZG worked Montreal from Shawinigan Falls on 144 Mc. GP has new NC-183 receiver and SA is proudly using NC-240D. NA has an 815 on 50 Mc. and worked W9ZHI, on that band. ZZ has changed QTH to St. Gabriel de Brandon for the summer, and is active regularly. AIO has a pair of 815s, in all-band 3.5 to 50 Mc., 'phone and c.w., with super modulation on 'phone. DX is using new all-band sky wire, 300-ohm folded dipole with

(Continued on page 84)

The RADIO SHACK Corp.

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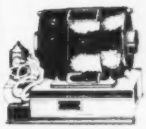
1951 CATALOG JUST ISSUED!

WRITE TODAY for your FREE copy of the giant new 172-page Radio Shack Catalog — America's most complete, lowest-price electronics line. Latest post-Korean war releases of new equipment. One of the few all-new catalogs that will appear this year!

FREE

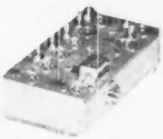
GO MOBILE WITH THESE G.E. 6 VOLT DYNAMOTOR SUPPLIES



XMTING $8.95

Made by G. E., originally used in police cars. Base-mounted, perfect for car or boat. Filtered. In 6V at 22A, out 300V at 160 ma. 11" x 9" x 8", 36 lbs. Can be used to replace scarce PE-103. Used condition, but a real buy at $8.95.

30 MC I.F. STRIP



Easily worth $15 and brand new (taken from R-7/APS-2 scope). Excellent, completely wired foundation unit for 2 and 6 meter cascode converter, swell for fixed freq. 10 meter revr, FM revr or TV strip. Sockets for six 6AC7, two 6H6, 1 6SN7 tubes (tubes not included), plus 5 i.f. stages, UHF "input" and power receptacles, 13 x 5 x 2" enclosed aluminum chassis with bottom plate! **$3.79.**

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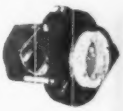
24VDC/110VAC* BLOWER



*Excellent 110 VAC unit by inserting 70 ohm 200 watt series resistor (or 200 watt lamp). Brand new REDMOND blower removed from R-7/APS-2 scope for this bargain sale. Draws 1.35 amps; about 60 cfm; 4750 rpm; two 1¼" outlets; protective screen over 2" dia. intake; black crackle finish; 5 x 7". Ideal for darkrooms, cooling ham rig, exhaust fan, air conditioning, etc. Easily worth 2-3 times our LOW price of **$3.75** each, 2 for **$7.00.**

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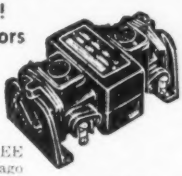
NEW SUPPLY! LOWER PRICE!

CALLING ALL MOBILERS! We Have 6 Volt Dynamotors (CARTER Magmotors)



- List Price $51.50
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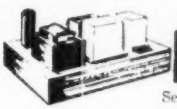
New lot-new lower price that's THREE BUCKS under our price 60 days ago and THAT was a bargain, too. Model MA-251 Carter Magmotor is the 6-volt receiving type preferred for mobile rigs, cabs, police mobile, etc. PM field design, low drain, ball-bearing equipped. Input 6 VDC at 8 amps, output 250 VDC at 100 mils. 4800 rpm continuous duty. Only 5¼ x 3¾ x 2½", weighs only 5 lbs. Used, good condition. RUSH your mail order today. No more when these are gone! **$6.95.**

ONLY **$6.95**



SAVE $10 On This 400 VDC @ 200 Mils Power Supply Kit!

Should be $17.95 YOURS for only **$7.95**

Sensational value! Designed for revrs, xmtrs, testers, oscillators, preselectors, monitors, amplifiers, etc., requiring well-filtered supply. Kit includes: *power xformer, choke, two 10 mfd at 400 V oil-filled condensers, 5T4 rect. tube, octal socket, 7 x 11 x 2" aluminum chassis, bleeder resistor, switch, and line cord.* Gives a well-filtered supply of 400 VDC at 200 mils with less than 1% ripple. Has secondary voltages of 6.3 V at 4.2 amps, 5 V at 3 amps.

1st FOR SELECTIVITY! 1st FOR SENSITIVITY! 1st FOR STABILITY!

Radio Shack Corp. crossed the Atlantic to bring American hams the #1 double-conversion superhet receiver in its price class — the Radiovision Ltd. COMMANDER. Features include: 1600 kc 1st i.f., 100 kc 2nd i.f. — 3 position selectivity; over 12" semi-circular bandspread on 10 meters; 1-2 microvolt input for 50 milliwatt output; complete coverage 1.7-31 mc in 5 bands; panel bandspread cal. adjustment against external freq. standard. Immediate delivery — *Amateur Net Price $261.50 only $26.15 down.* Write today for descriptive literature.

Several territories still open for distributors; phone or wire today

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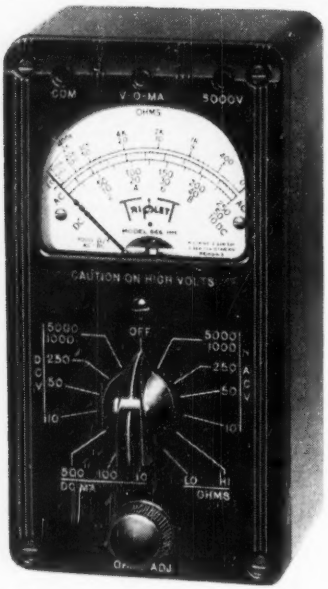

Model 666 HH — *The* Basic Hand-Size Volt-Ohm-Milliammeter

One of the "handiest" instruments for its size that ever came off Triplett's precision production lines. Its greater scale readability means faster, more accurate work. Special new type resistors provide greater stability. All the ranges you need. This is a basic pocket size necessity for the electric technician.

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feeder attached one-third of its length from one end, and reports excellent results. Field Day was a huge success with more field locations than ever before. These included NI at Valois, UR at Lachine ARC at Montreal, SY mobile, OE at the Citadel at Quebec, and QN at the Plains of Abraham, Quebec. Traffic: VE2QN 182, GL 44, EC 27, NI 3.

VANALTA DIVISION

BRITISH COLUMBIA — SCM, Ernest Savage, VE7FB — MU has finished another large ship for lake traffic and worked mobile from Kelowna during the building. AFH was in town and reports he will be back on soon. ZF is building 7-Mc. c.w. rig. TF reports that working for a living seriously interferes with his amateur activities. AKG is reporting in from Prince Rupert and may be a permanent fixture there. TG, EC Victoria Area, reports much doings in the EC set-up. ABP owns new HQ-129X and is heading for Prince Rupert to use it. ANX is rebuilding around a pair of 810s; bet OJ is planning to discourage it while he has time to knock off DX on 14 Mc. ABG is a newcomer and is on 7 Mc. with Command transmitter and receiver. AKK is raising his beam higher. AZ is out of the hospital and doing fine. AIH is sporting a four-element beam. ADB is building a double conversion receiver for winter's DX. ADV now is VK3ADV in Melbourne on 14 and 28 Mc. UT reports he is too busy with traffic nets for anything else. The Delta ARC would like all members to be able to copy 20 w.p.m. so they can handle traffic if emergencies arise. OK's 8JK in the attic must be working as he lists ZK2AA and VR1C. TP reports good TV at new QTH. AX's ambition is 100 QSLs with 100 countires from 100 watts. Are you a BSB? See your SCM for information. The British Columbia Net reports traffic was handled by TM, AMO, EAU, YL CS, ACZ, and OD. Traffic: VE7UT 198, TF 126, CS 114, TM 37, ACZ 33, OD 26, FB 15, YI 15, AEU 11, ZF 7, AMO 3.

WWV–WWVH SCHEDULES

FOR the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WWVH, Maui, Territory of Hawaii, on the following schedules:

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U or N, indicating warning, unstable conditions, or normal, respectively.

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely on the hour and each five minutes thereafter. Code announcements are in GCT using the 24-hour system beginning with 0000 at midnight; voice announcements are in EST. The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes. Each carrier frequency is modulated by a seconds pulse which is heard as a faint tick; the pulse at the beginning of the last second of each minute is omitted.

Station WWVH, operated to provide coverage of the Pacific area, broadcasts on an experimental basis on 5, 10 and 15 Mc. The program of broadcasts on the three frequencies is essentially the same as that of WWV. Reception reports indicate that WWVH is received at many locations not served by WWV, thus extending the area served by standard frequencies and time signals. Time announcements in GCT are given from WWVH every five minutes by International Morse code only.

SWITCH TO SAFETY!

HARVEY *for variety for bargains*

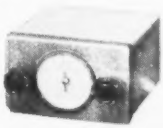
BC-221 FREQUENCY METER

These won't last long so order now for one of these famous freq. meters. They are just like new with original calibration charts. Range 125-20,000 kc. with crystal check points in all ranges. Complete with crystal and tubes.

Special Price $79.50

GON-SET CONVERTERS

3-30 Gon-Set Converter; 10-11 Gon-Set Converter; 20 meter Gon-Set Converter; 75 meter Gon-Set Converter. *Shpg. Wt. each 4½ lbs.* each, **$39.95**



Gon-Set Noise Clipper, *Wt. ½ lb.* **$8.25**

NEW Gon-Set Tri-Band Converter **$42.50**

SUPERIOR POWERSTATS

Smooth, efficient, voltage control, 0-135 volts output from 115 volt AC line. Models also for 230 volt input. Write for free literature. Models for table and panel mounting.

Type 20, 3 amp	$12.50
116, 7.5 amps, table mtg.	23.00
116U, 7.5 amps, panel mtg.	18.00
1126, 15 amps	46.00
1156, 45 amps	118.00

NEW COLLINS 75A-2

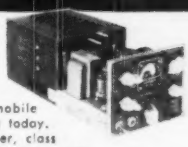
Double-conversion superhet with sensational stability, calibration accuracy and sensitivity . . . all the good features of the 75A-1, plus many new ones. Get your order in now for September delivery. Price, complete with tubes **$420.00**; matching 10-inch speaker **$20.00.**

ANTENNAS

Complete line of **Premax** and **Master Mount** antennas and mounts carried in stock at all times. **All Hy-Lite** 6, 10, 20 meter beams as well as TV Yagis always in stock.

NEW SOUND ROOM
Come in and see our new sound room. Everything on working display. All leading lines.

THE NEW SUBRACO MT 15X



The finest in mobile rigs available today. 30 watts power, class B 100% modulation, with push-to-talk and built-in coaxial type antenna relay. *Xmttr complete with tubes, coaxial antenna connector, mounting brackets, etc. Shipping weight 15 lbs.* **$87.50**

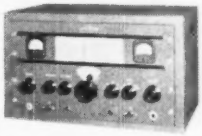
BRAND NEW—MT15X for 20 meters $87.50

SUBRACO D5400

Dynamotor supply, 6 V. DC input, 400 V. at 175 ma. output. Complete with built-in control relays, filter, etc. *Shpg. Wt. 10 lbs.* **$79.95**

COLLINS 32V-2 xmittr

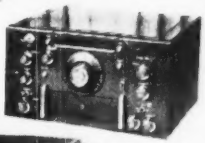
$575.00

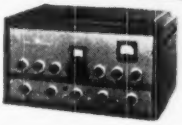


SELECT-O-JECT $24.95

HRO-50

$335.00



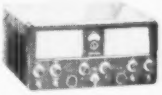


JOHNSON VIKING KIT

$209.00

HALLICRAFTERS SX-71

$179.50



MILLEN 90651 Grid Dip Meter **$55.00**

MILLEN 90800 the ever-popular 807 exciter, complete with one set of coils, less tubes and power supply **$42.50**

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The most valuable piece of test equipment in the ham shack is the Grid Dipper. Build one with this kit and save countless hours in building, improving and de-bugging your rig. The GDO Kit builds an exact duplicate of the "Grid Dipper", now with regeneration. Includes everything from the special handy case permitting one-hand operation down to a complete application and instruction book. With tube and internal power supply, range 3 Mc to 250 Mc in 6 steps, size 5½" x 2⅜" x 3". **Complete Kit $24.50**

Eldico TVT-62 low-pass filter, kit	$7.99
Wired and tested	$10.99
Eldico TVR-300 for Twinex or, TVR-62 for co-ax, high-pass filter, kit	$1.98
Wired and tested, either type	$3.98
Brute Force line filter, kit	$5.98
Wired and tested	$8.98
Copper mesh shielding, 36" wide, min. order 6 sq. ft., per sq. ft. plus $.50 per order for packing.	$.85
TR-1 transmitter kit	$179.50
TR-75 transmitter kit	$34.95
MD-40, 40-watt modulator kit	$29.95
MD-40-P, same with power supply	$39.95
MD-100, 100-watt mod. kit	$44.95
Wired and tested	$54.95

ELDICO HIGH VOLTAGE POWER SUPPLY KITS

Kit No.	Output	Price	Transformer only
HV-1500	1500 v. 350 ma.	$29.50	$19.50
HV-2000	2000 v. 500 ma.	69.50	39.50
HV-2000SP	2000 v. 700 ma.	89.95	49.95
HV-2500	2500 v. 500 ma.	99.95	69.95

Electronic Bug, automatic dots and dashes:

EE-1, kit form	$21.95
Wired and tested	$27.95
EE-2, with integral monitor, Kit form	$29.95
Wired and tested	$39.95

Learn code . . or speed up with the Gardiner Automatic Sender, Type S **$24.00**

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"I have had a dozen or so offers since I mailed some fifty of the two hundred employment applications your school forwarded me. I accepted a position with the Civil Aeronautics Administration as a maintenance technician. Thank you very much for the fine help your organization has given me."—Dale E. Young, 22 Robbins St., Owosso, Mich.

GETS JOB IN BROADCASTING

"I have accepted a position with KWAD. I secured this position through the help of your Job-Finding Service and I had at least six other offers. I am sincerely under obligation to you."—Fred W. Kincaid, Box 241, Wadena, Minn.

GET ALL 3 FREE!

MAIL COUPON NOW!

CLEVELAND INSTITUTE OF RADIO ELECTRONICS
Desk QT-21, 4900 Euclid Bldg., Cleveland 13, Ohio

I want to know how I can get my FCC Commercial ticket in a minimum of time by training at home in spare time. Send me your amazing new free booklet, "Money Making FCC License Information," as well as a free sample FCC-type exam and Free Booklet, "How to Pass FCC Commercial License Examinations." (Does not cover exams for amateur license.)

Name ..... Approved for Veteran Training under the G.I. Bill of Rights
Address .....
City ..... Zone ..... State .....
☐ Veterans check for enrollment information under G.I. Bill

Converters for V.H.F. Use

(*Continued from page 16*)

for the best reception you've ever experienced, but there may be another job, depending on the receiver with which the converter is used. It is well known that some communications receivers are prolific sources of TVI. These same receivers may make life miserable for the user of a fixed-frequency converter as the result of their strong oscillator harmonics. With several receivers tried these crystal-controlled converters had no birdie problem, but with one other the 2-meter job has several strong birdies that can be pretty confusing when one tunes the band after a CQ. The treatment takes on the aspects of a TVI job, using traps and filters in the same way as in a transmitter but the job is simpler in the case of the receiver because there are no high-power considerations.

The "Mountaineer"

(*Continued from page 19*)

out, the total B-battery drain should rise to over 40 ma. when the key is closed. The final should not oscillate when the key is closed. Be careful not to hold the key closed too long since, without excitation, the 3A4 may be damaged.

The station VFO may be used as a signal source for adjusting the receiver. The slug in T_{1B} should be adjusted to put 3750 kc. near the center of the receiver tuning dial (C_{13}). The slug in T_{1A} should be adjusted for proper feed-back.

A second chalk-line box contains 50 yards of 27-pound-test fish line. This line can be tied to a stone and thrown over a tree. The stone is then replaced by the antenna chalk box, and the antenna is pulled up. Next, the ground counterpoise is unrolled and the headphone and key are connected.

The channel switch and the receiver tuning dial should then be set. Set the meter switch to read amplifier plate current, close the key and load for 16 ma. (0.53 on the meter) at the plate current dip. It is wise to check battery voltages at this point. The tank circuit should *not* be retuned while receiving. Switch to "Receive" and adjust the volume and regeneration.

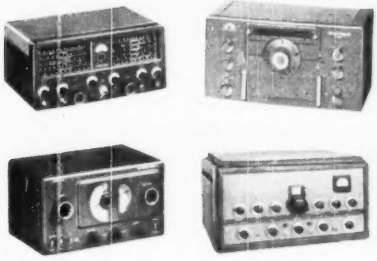
Although a wide variety of antenna lengths may be used, antennas about a quarter or a half wavelength long work best. If you don't want to bother to prune the system to the correct length, a 500-$\mu\mu$fd. tuning condenser may be added in series with the lead to the counterpoise.

Spare tubes, fuses, and an extra dial light should be carried. There is no table or tripod. Evenings often are so chilly that the rig is operated from inside a sleeping bag! One problem that we have not yet solved is that of an adequate source of light for copying messages. When considering a light, one should remember that mountain meadows produce an enormous supply of mosquitoes!

Your NEW 1951 ALLIED CATALOG *is Ready Now!*

212 VALUE-PACKED PAGES

YOU'LL FIND ALL THE NEW GEAR IN YOUR NEW 1951 ALLIED CATALOG



Send for the Leading Amateur Buying Guide

It's ready for you—the *only* Amateur Buying Guide that gives you *complete* selections of station equipment at consistently lowest prices. The new 1951 ALLIED Catalog brings you all the newest and best in receivers, transmitters, parts and station gear, ready for immediate shipment from the world's largest stocks.

Expert service by our seasoned ham staff—dollar-saving trade-in allowances, an amazingly liberal Time Payment plan—15 day trial on receivers—full 90-day guarantee—all these add up to the most reliable, money-saving service in Amateur Radio. Send for your 1951 ALLIED Catalog today—and get all these buying advantages.

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City.....*Zone*.....*State*.....

Get it at . . . WHOLESALE RADIO

If You Want VALUE . . . QUALITY . . . & SERVICE

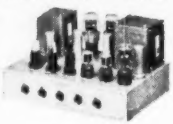
GET HI-FIDELITY

Like You've Never Heard Before

PEERLESS HI-EFFICIENCY TRIODE AMPLIFIER KIT

HERE'S WHAT YOU GET!

4 Peerless Transformers, Chassis, Bottom plates, RC Mounting board, all instructions and diagrams.



Model 10722

Only **$46.80**

LOOK AT THESE FEATURES! 20 to 20,000 cps. response ± 0.5 db. 12 W. output at 2½% intermodulation distortion. 7 db. of inverse feedback through 5 stages and output transformer. Cathodyne phase inverter. Cathode follower driver. Equalized for GE, Pickering, etc., pickups. Tone control. 8 tubes: 2-6J7, 1-6J5, 2-6SN7, 2-6AS6, 1-5V4G. Tubes not included in kit.

GET READY TO WORK 10-METER BAND

Here are the basic components for building

MOBILE POWER SUPPLY

AND EMERGENCY STATIONARY USE

Ideal for Low Power Transmitters and Receivers —

Operates on 6 V. D.C. or 110 V. 60 cycles. H.V. output. 325 D.C. at 135 MA. 6.3 V. CT, 4.75 amps. Complete instructions and schematic included with power transformer T22R24.

BASIC REQUIREMENTS

Thordarson Vibrator Power Transformer. T22R24 $8.64

Thordarson Filter Choke T20C54 .... $2.94

Tandem Vibrator No. 490. 6 V.-110 V. Dual Primary $8.91

GONSET CONVERTERS

"3-30 mc"

MOBILE

$39.95

10-11 Meter Mobile Converter for 27-30 mc **$39.95**

Gonset Clipper **$8.25**

Tri-Band Converter **$42.50**

All-Band MASTER MOBILE MOUNTS AND ANTENNAS

Body Mount fits any body contour. Model 132. **$7.95**

ANTENNA

For 75-40-20-10 meters. Comes with 1 coil. (Specify band) **$7.95**

Terrific Motor Value

ALLIANCE 110 V. AC MOTOR

Model MS. 2800 rpm at full load with 110 v. 60 cycles, 0.3 amps., and 16 watts input. 4¼" x 2" x 1¾". Suitable for light loads such as fans, phono turntables, etc. At this low price because they were removed from new rotators **$1.69**

WRITE FOR FREE FYI BULLETIN

Address orders to Dept. QS-9

WHOLESALE RADIO PARTS CO., Inc.

311 W. Baltimore St.

BALTIMORE 1, MD.

V.H.F. QSO Party

(Continued from page 27)

5) A "contestant" is a single operator working without the help of any other person. Results may be presented with names of all participating persons, for listing, but only single-operator scores will be considered for certificates.

6) Scoring: *1 point* for completed two-way section exchanges on 50 or 144 Mc.; *5 points* for completed two-way section exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked, i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted.

7) A contact *per band* may be counted for each different station worked. Example: W1JSM (E. Mass.) works W1MEP (Vt.) on 50, 144 and 220 Mc. for complete exchanges. This gives W1JSM 7 points (1 + 1 + 5 = 7) and also 3 section-multiplier credits. (If more Vermont stations are subsequently contacted on these bands they do not add to the multiplier but they do pay off in additional contact points.)

8) Each section multiplier requires actual completed exchanges with *at least* one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

9) Award Committee decisions shall be accepted as final.

10) All reports must be postmarked no later than October 10, 1950, to be entered for awards. (See p. 55, May, 1948, *QST*, for form, or a message to Hq. will bring a mimeographed blank for report on this contest.)

Reporting

Submit contest logs to Headquarters immediately, even if your score is small, to help in cross-checking the claims of others. — *F. E. H.*

Two-Control Transmitter

(Continued from page 32)

This transmitter has been operated on 7 Mc. within three feet of a TV receiver in a fringe-area location without causing harmonic interference. With the harmonic trap detuned, there was a very slight trace of interference, but this disappeared completely when the trap was tuned to the offending harmonic. Up to the time of writing, there has been no opportunity to make similar checks with the transmitter operating at higher frequencies, but a sensitive rectifier-type r.f. indicator coupled tightly to the antenna coil shows no trace of TV-range harmonics with the transmitter running full power on either 10 or 20.

U.S.A. Calling

(Continued from page 32)

AGE REQUIREMENTS — All applicants must have passed their twenty-first birthday and on the date of appointment must not have reached the birth date indicated below for the grade for which applying.

Second Lieutenant	28	Major	45
First Lieutenant	33	Lieutenant Colonel	51
Captain	37	Colonel	56

Interested applicants may write to George W. Badey, 1 East 79 Street, New York 21, New York, for further information, including names and locations of officers to whom application should be made, application blanks, etc. Many other opportunities, not listed, are offered to technical and professional specialists. If your specialty is not covered by the above list, write for further information, giving full details.

BOB HENRY, WØARA, OFFERS YOU:

LOW PRICES: I sell to you as cheap or cheaper than you can buy anywhere.

COMPLETE STOCKS: Collins, Hallicrafters, National, Hammarlund, RME, Millen, Harvey-Wells, Meissner, Gonset, Meck, Johnson, RCA, all other amateur receivers, transmitters, beams, TV, AM-FM, high fidelity amplifiers and speakers, test equipment, tubes, parts, etc. I can supply nearly any equipment shown in any catalog or advertisement and at lowest prices.

BEST TRADE-IN ALLOWANCE: Customers in all parts of the USA trade with me because I allow so much. Tell me what you have to trade and what you want. I also buy equipment.

TIME PAYMENTS: You can order anything on terms. I finance the terms myself to save you time and bother. Customers everywhere in the USA find my terms best. Write for details.

QUICK DELIVERY: Mail, phone, or wire your order. It will be shipped promptly. I can be reached nearly 24 hours a day, 7 days a week.

TEN-DAY TRIAL: Try any communications receiver ten days -- if you return it your only cost is shipping charges.

PERSONAL ATTENTION: The Butler store is run by Bob Henry, WØARA, and the Los Angeles store by Ted Henry, W6UOU. We make the deals ourselves. We finance the time payments ourselves. That way we have the lowest overhead and can do more for you. That's why YOU AND I CAN DO BUSINESS. Write, phone, or visit either store.

73,

Bob Henry
WØARA

Butler 1, Missouri **HENRY RADIO STORES** 11240 Olympic Blvd. LOS ANGELES 25 CALIF.

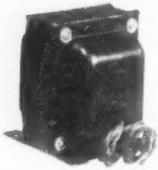
"WORLD'S LARGEST DISTRIBUTORS OF SHORT WAVE RECEIVERS"

LOOK

DUAL PLATE XFMR

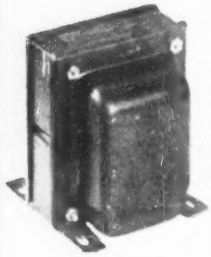
815–0–815 volts, 250 Ma., PLUS 385–0–385 volts, 65 ma., 115 volt, 60 cycle primary, electro-static shield, upright mounting, fully shielded. A beautiful transformer with many applications. 5¼" x 4⅜" x 5⅛", 17 lbs..... **$6.95**

PLATE TRANSFORMER



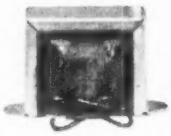
510–0–510 volt, 200 Ma. transformer, fully shielded, upright mounting, electro-static shielding, 4½" high, 4" wide, 4" deep, 9 lbs. at less than half regular price... **$3.95**

10 HENRY CHOKE



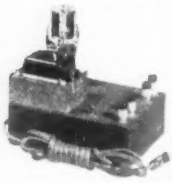
10 Henry, 250 Ma. choke, 100 ohms DC resistance, 3000 volt insulation, upright mounting, fully shielded. Check this price against ANY ad. 4⅜" x 4" x 4", 9 lbs..... **$2.95**

10 HENRY 200 MA. CHOKE



150 ohms dc resistance, 1500 volt insulation, moisture proof, mounting centers 3⅛". Here is the best buy to date, only.. **$1.49**

POWER SUPPLY SCOOP!



Utility power supply, 350 volts dc @ 50 Ma., 6.3 volts @ 2 Amp., black crackle chassis 6¼" x 5" x 2". Has choke and 2-section filter, AC switch and line cord, a wonderful buy, less No. 80 rectifier, only.... **$2.25**

Steinbergs

633 WALNUT STREET • CINCINNATI 2, OHIO

U. S. N. R.

(Continued from page 33)

via 144 Mc. by W6TFZ/6 (ARRL EC) at San Carlos City Hall to K6NAC, from where it was transmitted by Naval channels to San Francisco and thence to Washington. . . . Electronics Company 12–9 (K6NRU) coöperated with the Humboldt Radio Club in an exhibit and demonstration of amateur radio and electronics at the annual Hobby Show at Eureka, Calif., on May 6th and May 7th. . . . Organized Surface Division 9–39 of Indianapolis (K9NR) won the communication trophy in the Ninth Naval District Reserve competition for the quarter ending June 30th. . . . K5NRG, Naval and Marine Corps Reserve Training Center, Corpus Christi, Texas, was participant in a test of amateur radio message-handling capabilities on April 27th. An officer from Naval Air Station, Corpus Christi, filed a message for New York City for handling via ham bands. A duplicate message had been filed for transmission by teletype. K5NRG relayed through W0GZR, Joplin, Mo., to W2PAJ, Brooklyn, N. Y., on 14-Mc. 'phone. W2PAJ delivered the message and transmitted a reply via W0GZR to K5NRG. Total time for delivery via teletype: 1 hour, 21 minutes; via amateur radio: 1 hour, 25 minutes. . . . Study classes for personnel desiring to obtain an amateur radio operator's license have been instituted at Naval Reserve Training Center (K8NAK), Pontiac, Mich., under the guidance of G. G. Carlson, W8EYL. Classes are held at 7:30 P.M. each Monday. Thirty-five students were enrolled by the first night, June 26th. . . . The Hutchinson (Kans.) Amateur Radio Club holds regular meetings, first and third Thursdays, at the Naval Reserve Training Center (K0NRY). . . . Electronics Company 1–2 (K1NRA), Malden, Mass., won the First Naval District pennant in annual inspection of volunteer Reserve organizations. This unit has been selected for organized status. . . . The Lake County Amateur Radio Club meets in the quarters of Electronics Company 9–186 (K9NAC), Waukegan, Ill.

—·—·—

"Open House" was the order of the day at many Naval Reserve Electronics units on Armed Forces Day, May 20th. . . . Operation of K2NAB was of considerable interest to visitors at Electronics Company 4–13, Princeton, N. J. Lieut. Cmdr. J. L. Richey USNR, K2AT is commanding officer of this group. . . . Visitors at K6NAA, Electronics Company 12–39, Sonoma, Calif., were invited to file hamgrams. . . . In addition to Open House, Electronics Company 5–10 (K4NAS) provided a mobile radio unit in the Armed Forces Day parade at Ashland, Ky. . . . Among other Electronics Companies holding Open House were 9–186 (K9NAC), Waukegan, Ill., 4–6, Stroudsburg, Pa., 12–21 (K6NBB), Paso Robles, Calif., 12–18, Auburn, Calif. and 9–166 (K9NAG), Downers Grove, Ill. . . . During the Armed Forces Day celebration at Placerville, Calif. Electronics Company 12–26 was presented with a silk flag by El Dorado Post No. 119, American Legion. . . . Electronics Platoon 9–11, Hot Springs, S. D., provided the Navy portion of an Armed Forces Day exhibit of Reserve Units at Rapid City Air Force Base. . . . On May 18th, 19th and 20th the mobile Emergency Communications Unit of Naval and Marine Corps Reserve Training Center, Indianapolis, Ind., was stationed on the World War Memorial Plaza as part of the display of military equipment. W9AKP operated the unit under the Training Center's call, K9NR/9, to demonstrate use of the equipment under field conditions.

Single Sideband

(Continued from page 37)

job, drop a note to W2SNQ. W3KPP reports that SNQ is offering tested sets of components for the phase-shift network of the W2UNJ-type exciter.

W8LRK writes to suggest that perhaps a combination of controlled carrier and s.s.b. might help to solve the problem of critical receiver tuning that scares off so many of the a.m. gang. The controlled carrier could be switched out, of course, after the receiving operator had been instructed in the carrier-reinsertion tuning technique. Anyone interested in trying it? — *B.G.*

LEEDS

"The Home of RADIO"

Our 28th Year

QUALITY – PRICE DEPENDABILITY

ALUMINUM CHASSIS

7x5x2	18 gauge	$0.82
7x7x2	18 gauge	$0.92
9x7x2	18 gauge	$1.03
5x10x3	18 gauge	$1.12
7x11x2	18 gauge	$1.06
12x10x3	18 gauge	$1.62
10x14x3	16 gauge	$2.26
15x7x3	16 gauge	$1.76
17x10x3	16 gauge	$2.20
17x13x3	14 gauge	$2.82
17x13x5	14 gauge	$3.67

We carry a complete stock of steel & Aluminum Chassis & Panels.

TERRIFIC BUY

6.3 Volt @ 10 amp. filament transformer, upright mounting. Cased. **$1.69**

Can also be used as a 12 volt, 5 amp. transformer.

SUPERIOR POWERSTATS

Smooth, efficient voltage control. 0 to 135V. output from 115V. AC line.

Type 20 (illustrated 3 amps	$12.50
116 for table mtg 7.5 amps	23.00
116U for panel mtg 7.5 amps	18.00
1126 15 amps	46.00
1156 45 amps	118.00

Also available for 230 volt input. Write for descriptive literature.

CHOKES

SMOOTHING TYPE	Hy	SWINGING TYPE	Hy	MA	PRICE EACH Price
C-80	10	C-87	4–16	150	$3.09
C-81	10	C-88	4–16	200	$3.82
C-82	10	C-89	4–16	250	$5.29
C-83	8	C-90	3–14	300	$5.59

All above 3000 Volts Insulation

NATIONAL CABINETS & SUB-BASES

THE BUY OF THE YEAR—We just purchased the entire stock from National. Steel cabinets and sub-bases. Of course, they are brand new—and Y-O-U S-A-V-E 70% from list.

CABINETS

Type C-HRO-7, 19¾" w, 10" h, 10" d	$6.00
Type C-NC-183, 19¾" w, 10½" h, 15" d	$7.50
Type C-NC-173, 19¾" w, 10½" h, 12" d	$6.00
Type C-NC-33, 16½" w, 8¾" h, 8½" d	$3.75

SUB-BASES

B-HRO-7	$1.40
B-NC-183	$1.65
B-NC-173	$1.50
B-NC-33	$1.05

These metal cabinets are exactly the same used for the latest type receivers. Made of heavy gauge steel with rounded corners, in blank form, sprayed and baked in light gray enamel. Bottom and back removable.

PLATE TRANSFORMERS

For Small Transmitters. DC Voltage Ratings are Approx. Values Obtained at Output of a 2 section Choke input Filter. Using Mercury Vapor Rectifier Tubes Pri. is for 115 V. 60 cy.

Type No.	Sec. Rms. Volts	DC Volts	Sec. MA.	Dimensions H.	W.	D.	Price Each
P 57	660–660†	500	250	4⅝	3½	4⅜	$ 6.76
	550–550	400					
P 58	1080–1080	1000*	125	4⅝	3½	5	8.23
	500–500	400	150				
P 59	900–900	750	225	4⅝	3½	5⅛	7.94
	800–800	600					
P 67	1450–1450	1200	300	5¾	6⅛	4	19.84
	1175–1175	1000					
P 68	2100–2100	1750	300	5¾	6⅛	4¼	24.99
	1800–1800	1500					

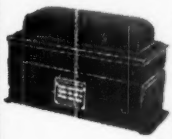
* For dual operation with simultaneous use of both sec. ratings.

† Has 40-volt bias tap.

RAYTHEON VOLTAGE STABILIZERS

Positive Stabilization ±½%

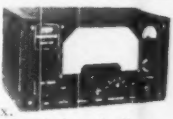
Input 95-130 volts, 60 cycles single phase; output 115 volts stabilized to ±½%. *Output 6.0 or 7.5 volts stabilized ±½%.



Catalog No.	Output Cap. Watts	Net wgt. lbs.	Net Price
VR-6110	15	4	$15.00
VR-6101	30	5	$17.00
VR-6111	30	5	$17.00
VR-6112	60	8	$24.00
VR-6113	120	14	$31.00
VR-6114	250	25	$48.00
VR-6115	500	45	$75.00
VR-6116	1000	92	$125.00

LYSCO

EXCITER — TRANSMITTER



Model 600 De-TVI-ed VFO or XTAL — Model 500 Conventional

35 watts input on 10, 11, 20, 40, 80 & 160 meters. Output 50 ohm coax.

Break-in keying—P.A. meter—Band switch and all controls on front of panel. Large illuminated vernier dial. Series/Tuned "Colpitt's" Oscillator—Voltage regulated power supply-Modulator terminals at rear of chassis.

Tubes—6AG7 Oscillator, 6AG7 Buffer, 807 P.A., 5U4G Rectifier, VR-150 Voltage regulator. Furnished in handsome metal cabinet 15"x19"x8" complete with tubes, ready to go.

Model 600 $119.95

Model 500 $109.95

Descriptive bulletin on request.

Model 50 Antenna Coupler designed to feed long wire from transmitter ..... **$ 11.95**

GRID DIP METER LYSCO "DIPMASTER"

3 Mc to 150 Mc frequency range; calibrated dial. Ideal for Signal generator, 3.4 to 300 Mc range phone monitor, F.S. meter, or absorption wavemeter. Complete power supply and tubes. Really a good buy at $32.83

BC 434-A. Used with radio compass receiver R5-ARN-7 Bendix ADF equipment **$1.50**

T30-THROAT MIKE 10 for **$1.00**

FL-5-LAZY Q RADIO FILTER Unit, High Impedance **$0.75**

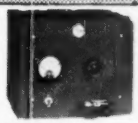
REMOTE CONTROL BOXES

For SCR 522's. Brand New in Original Packing; Consists of 5 push button switches, 5 Western Electric Pilot Assemblies, with Pilot Bulbs and Dimmer, and lever Switch all finished in Black Crackle. Order yours Today for only ..... **$ .95**

FILAMENT TRANSFORMERS

Type 940	2.5VCT @	10 Amps. 7500V Ins	$2.79
Type 040	5. VCT @	3 Amps. 2500V Ins	$2.06
Type 941	5 VCT @	6 Amps. 2500V Ins	$2.35
Type 943	5 VCT @	20 Amps. 2500V Ins	$5.29
Type 946	6.3VCT @	3 Amps. 2500V Ins	$1.91
Type 947	6.3VCT @	6 Amps. 2500V Ins	$2.79
Type 948	6.3VCT @	10 Amps. 2500V Ins	$3.67
Type 960	7.5VCT @	4 Amps. 2500V Ins	$2.35
Type 143	7.5VCT @	8 Amps. 2500V Ins	$4.12
Type 146	10 VCT @	10 Amps. 3000V Ins	$4.99
Type 961	Dual 6.3VCT @	3 Amps. 2500V Ins	$3.38
Type 041	5VCT @	3 Amps. 2500V Ins	$3.38
	6.3VCT @	3.6 Amps.	

RAPID ELECTRIC SELENIUM RECTIFIER MODEL 507 SPECIFICATION



AC Input—110/120V. AC 60 cycle single phase.

DC Output—5 Amperes 0-7 Volts Duty—Continuous

FEATURES:

Accurately calibrated voltmeter — Output current and voltage tapered control affecting smooth variation from zero to maximum — Full wave rectification with capacitor filtering for extra smooth (low ripple) DC power.

SUGGESTED APPLICATIONS:

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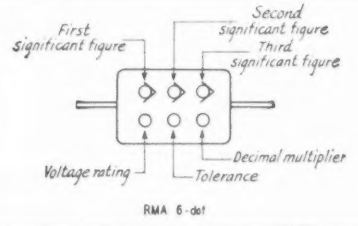
TABLE 18-III

Resistor-Condenser Color Code

Color	Significant Figure	Decimal Multiplier	Tolerance (%)	Voltage Rating*
Black	0	1	–	—
Brown	1	10	1*	100
Red	2	100	2*	200
Orange	3	1000	3*	300
Yellow	4	10,000	4*	400
Green	5	100,000	5*	500
Blue	6	1,000,000	6*	600
Violet	7	10,000,000	7*	700
Gray	8	100,000,000	8*	800
White	9	1,000,000,000	9*	900
Gold	–	0.1	5	1000
Silver	–	0.01	10	2000
No color	–	—	20	500

* Applies to condensers only.



RMA 6-dot

Yes, it's from the Handbook —

near the table of color coding on transformer windings in Chapter 18, a few pages past the chart that tells which size drill to use; a sample of the many different kinds of information you will find.

It does seem that — no matter what you want to know — the answer is in the 605 page

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Working DX

(Continued from page 43)

DX station anyway. They have a point, of course — they have been waiting as long as the "friend," they are just as eager for the contact, and they have the right to a fair chance. If the foreign station is trying to work some particular state that he may need for WAS and is being "hooked up" for that reason, any decent W will respect the request and stand by, even though his impatient fidgeting may cost him a new seat to his trousers.

In the "rat races" that develop around a new and rare DX station, you will often hear W stations calling while the DX station is transmitting. This generally happens when the W hasn't heard the DX station come back to anyone, because the DX was smothered by QRM, and so the W gives another call. Even the best operators are occasionally guilty of it, and it is an excellent argument why the DX station should not answer Ws on his own frequency. There are some W stations that can be observed calling the DX station all through a QSO, when there is no QRM, and the one obvious conclusion that can be drawn is that they can't hear the DX station anyway. These actions soon acquire for the W the well-earned reputation of "lid." If they can hear the DX, they must believe that the operator of the DX station will suddenly stop in the middle of his QSO and listen for other calls!

Under similar circumstances you will sometimes hear Ws calling the DX on the frequency of the W station in QSO, while the W is transmitting. This blatant violation of all operating ethics and courtesy is a despicable practice, and fortunately, it is confined to a few who seem to feel they are above reproach. Their reputations among other DX-chasers is not particularly

enviable. The time to call the DX station is *after* he has sent "SK" to signify the end of the QSO.

A highly-debatable point of ethics is how long a QSO should be with a rare DX station. Some W stations seem to go out of their way to stretch out the QSO, sending their full mail address (instead of a simple "Pse QSL via ARRL"), telling a ZD5 he is the first ZD5 QSO (when the ZD5 has only been on the air a week and is the first in the history of amateur radio), and to please QSL for DXCC, YMCA and RSVP! With

(Continued on page 94)

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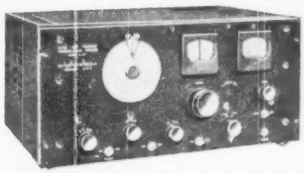
Famous HALLICRAFTERS S-37 AM-FM RECEIVER



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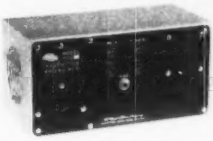

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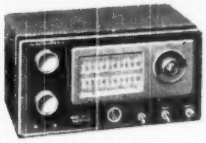

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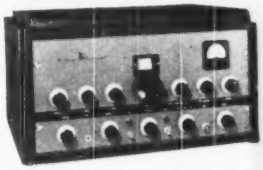

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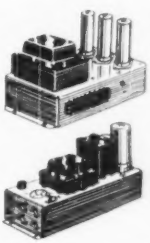

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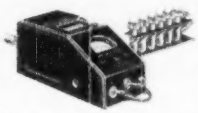

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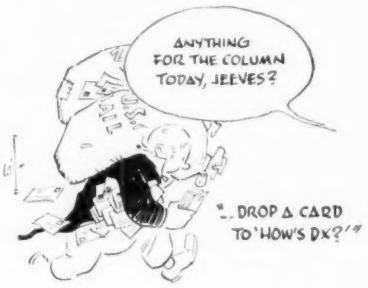
many the intent is perfectly understandable — the W is thrilled with the contact and wants to share his enthusiasm with the DX. But some, unfortunately, coolly calculate that they can keep others from working the DX by stretching out the QSO until the signals fade. To avoid this, even though at first glance it may seem rude, the W is well advised to limit his remarks to a bare minimum. If the DX station shows a desire to rag-chew, it is only common courtesy to follow suit, but the DX station should make all of the overtures.

The DX men who go after the rare ones and try to run up their country totals are an enthusiastic bunch, and they will spend a lot of time to work a rare station to swell their totals. But once they've worked the station they don't mind passing along the information to everyone else, and *QST* carries a column each month (called



"How's DX?") that reports the latest in the world of rare DX. When you do run into something good, drop a card to the DX Editor telling of your work, because it is this collective interchange of information that makes up the department. Pertinent information on time, frequency and mailing address (if the latter is not in the *Call Book*), and personal items about the DX stations, all are welcomed.

When You Are DX . . .

If you are operating from a foreign country that is well represented by many amateurs on the air, your operating can follow the pattern of general operating mentioned under "Common DX" and normally associated with general rag-chewing and traffic handling. If for some reason or other you find you are suddenly much sought-after, by virtue of having the only signal getting through from your country or for some other reason, your operating may take on the form to be outlined presently for rare DX. But normally just ordinary good operating will take care of anything you are likely to encounter.

If you represent rare DX, by happening to be in a rare country, you are going to find that the DX men are all anxious for a chance to QSO. You might as well resign yourself to the fact that for some time you will be so eagerly sought-after

(*Continued on page 96*)

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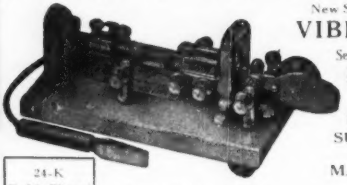

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that you won't be able to work stations fast enough. You will be pursued by amateurs all over the world waiting to add your country to their lists. By good operating, you can give them all their opportunity in a minimum of time, and then settle back and operate in any manner you please. Remember one very important point — *you* are in control of the situation, and whatever *you* say and do will determine the actions of the stations chasing you.

If you are rare, your first CQ will result in a number of answers, particularly if the band is open to the United States, Canada or other area with a large amateur population. If during your CQ you use "U" and "D" signals, you will keep most of the calling stations off of your frequency. If you don't use them, answer a station a few kilocycles one side or the other of your frequency. If you don't use "U10," "D5" and the like, you are going to be called on or very near your frequency, and the worst thing you can do is to reply to someone *exactly* on your frequency. If you do, *everyone* will be calling on your frequency after the QSO. If you answer slightly off your frequency, the stations calling you after your first QSO will be much better distributed, and several should be easy to copy. On 'phone, indicate where you will start tuning, as "listening down from 14,275" or "tuning up from 28,600." If you don't, the Ws will generally cluster at the nearest edge of their subband, where the QRM is always bad.

The first station you work is going to ask you for a QSL card. He is also going to ask you for your mailing address, and so are a lot of others. If your country has a QSL bureau, it is sufficient to say "QSL VIA BUREAU." Or, if you like, you can give the station your mailing address, with the request that he forward it to ARRL and RSGB. In this way it will appear in *QST* and the *R.S.G.B. Bulletin* and it will also be put in the *Radio Call Book Magazine*. When working stations in rapid succession, it is sufficient to give your address during every other QSO — the waiting operators will copy it during one of these times. If you are already listed in the *Call Book*, just say "QTH OK IN BOOK." The less explaining you have to do, the shorter you can make your QSOs. You can also shorten your QSOs by saying during your *first* transmission "WILL QSL VIA ARRL," "WILL QSO VIA BUREAU" or however you plan to do so. There is then no excuse for the station working you to go through the lengthy process of giving you his full address. Remember that the longer you make a QSO, the greater will be the number of W and VE stations waiting to work you. The shorter you can make each QSO the sooner you will get the "one-man contest" portion of your amateur life out of the way.

If possible, your first reply to a call should include a signal report, an assurance that you will QSL, and information on how a card can be sent to you. In signing over, be sure to include the call of the station you are working, because

(Continued on page 98)

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Ask the fellows who deal with me. They'll tell you that WRL will allow you more for your present equipment—that WRL's large volume of sales mean faster turnover and greater savings. Our customers know that we finance our own paper, eliminating all red tape. We will accept a low down payment and you can name your own terms. WRL buys more equipment—WRL sells more equipment. We offer the most personalized service anywhere.

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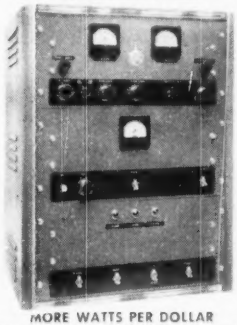

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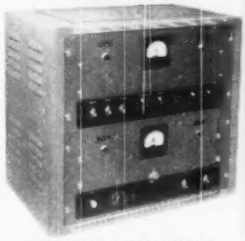

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A guyed tower up to 300 feet for commercial use?
As specialists in masts and towers for over 17 years, Trylon offers a complete, time-tested line at minimum cost for true safety and dependability. Write for descriptive circulars. Better yet, outline your mast or tower problem and let Trylon specialists recommend a suitable unit.
WIND TURBINE CO.
West Chester Penna.
TRYLON
TOWERS MASTS

you might have been covered by QRM when you first came back. Although it would appear to save a little time by not sending his call, actually it will pay off in fewer interrogations from stations breaking in to ask if you came back to them. Use "KN"[3] to designate that you are QSO and do not wish to be called. The reply from the station you are working will follow practically the same pattern of information that you gave him. Acknowledge him, give your "73" and sign with an "SK"[3] or a single "CQ DE. . . ." You have shown clearly that you are listening for new stations, and you will get plenty of calls. Don't make the mistake of going back to someone who may have called *during* your QSO. This is an open invitation for everyone to do it the next time around, and you will soon find further QSOs impossible. If during several QSOs someone persists in calling you on the frequency of the station you are working, disregard him entirely and make a mental note not to answer any of his calls for a few weeks or months or years. Once you reply to this type of operator, all will be chaos, because a number of others will then try it. And be careful not to answer anyone calling on your own frequency during any operating period, because you will immediately move the QRM over on to you, the station that raises you may not hear you come back, and only confusion will ensue.

Don't try to work more than one station at a time. In nearly all cases where this is tried, it results in the several stations being worked all coming back at the same time, which leads only to confusion. DX stations have succeeded in working several stations at once, but it requires superb operating and even then it is questionable if it saves time. You can economize on time by reducing remarks to a bare minimum. Your pursuers will realize quickly that you are an operator to be respected and will act accordingly.

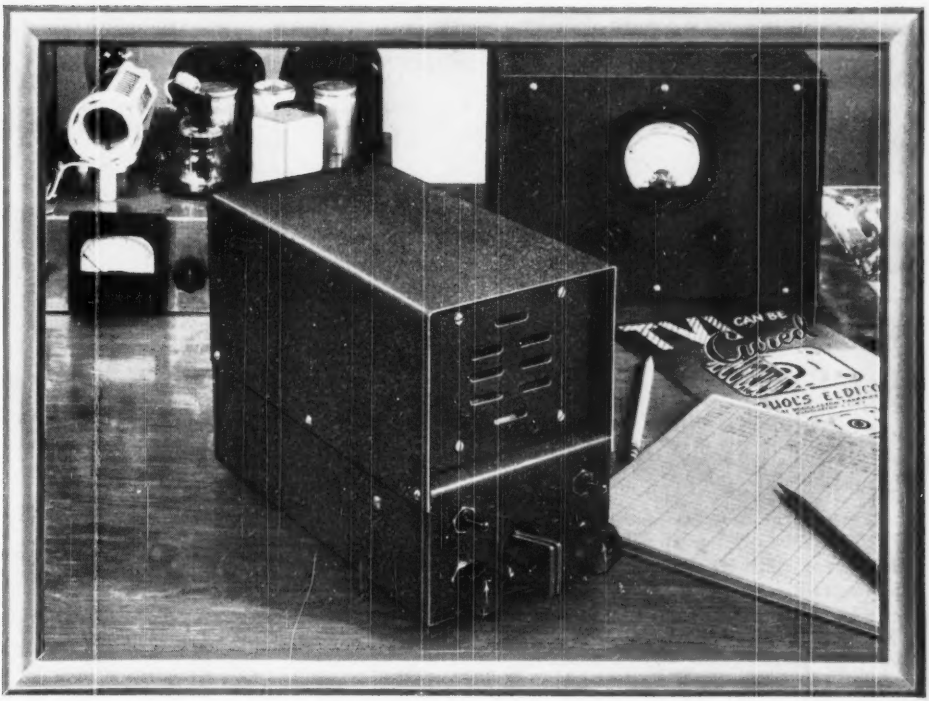
If some W asks you to "LOOK FOR MY FRIEND W . . . ," say "SORRY, TOO MANY CALLING." If you don't, you will find that everyone will call just the same, permitting no chance to pick the friend out of the group. It is much better to give everyone an open chance at you than to try to be a good fellow and do someone a favor.

Use "CL" to indicate when you are closing your station and abide by it, even though you hear scores of stations calling. Just before you sign, you can mention when you expect to be on the air the next time, and you can rest assured that a very short CQ at that time will bring a hearty response, if the same paths are open again.

These recommendations may seem rather cold-blooded and heartless, but they are things you will have to do to remain in control of the situation. Once you have worked and sent QSL cards to a fair number of stations, you will find that you are not smothered by calls as you used to be, and you can go your merry way and have

(Continued on page 100)

[3] "Basic Operating Procedure," *QST*, July, 1950.



Signals of Distinction

TUNE across any ham band and certain signals stand out for their quality of sending. Every transmission by these "Signals of Distinction" has the crisp quality, the rhythmical precision that only automatic transmission can impart.

Eldico, pioneers in quality kits for the amateur, now presents an electronic bug that represents the cumulative efforts of W6OWP* and the Eldico staff. The Eldico electronic bug is the first instrument to be offered commercially that includes all the features recommended by the experts for precision keying. Look over the technical featu-es, listen on the air, wiggle the paddle . . . then treat yourself to a new concept of effortless c.w. transmission. If your local distributor doesn't handle Eldico products you can order direct from the factory.

Eldico Electronic Bug. Self-completing type of automatic keying device. Features self-completing characters that automatically insure perfectly formed characters; continuously variable speed control for any rate of sending from 8 to 50 w.p.m.; separate control for weight of characters and ratio of dashes-to-dot length, allowing individual tailoring to your own fist; self-contained with built-in power supply in attractive black crackle portable case, complete with automatic key.

EE-1, complete kit including tubes and instructions. . . **$21.95**

EE-1, wired and tested. Electronic Bug ready to hook up to your rig **$27.95**

EE-2, complete kit including tubes and instructions and addition of integral keying monitor with speaker **$29.95**

EE-2, wired and tested. Electronic Bug with keying monitor, complete ready to operate **$39.95**

*Bartlett, W6OWP, "Further Advances in Electronic-Keyer Design," QST, Oct. 1948.
Bartlett, W6OWP, "Command Set Special," CQ, Nov. 1949.

FREE — **A complete free booklet for de-TVling your rig and a complete list of other Eldico kits including the famous grid dip oscillator and a full line of phone and c.w. transmitters. WRITE to W2UOL of Eldico.**

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INCORPORATED
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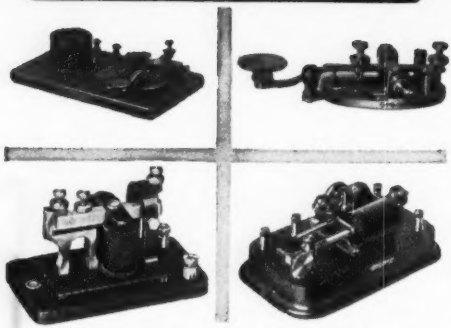
DOUGLASTON, L. I., NEW YORK

Signal
Wireless and Telegraph Instruments



From practice keys for beginners to the very finest commercial equipment, perfect performance calls for Signal. Send for FREE descriptive literature today!

Signal ELECTRIC MANUFACTURING CO.
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ATTENTION
MOBILE HAMS

Complete mobile package — nothing else to buy. Outstanding mobile signal- use motorola equipment — backed by years of communication equipment experience — World's largest producer of 2-way mobile equipment.

A mobile transmitter with a double feature FM or AM at flip of the switch, the MOTOROLA FMTR-30-DMS (27-30 MC.). **$130.00**

P-7253 spring base rear — mount antenna **$22.50**

New Gon-set Tri-Band Spread Converter **$42.50**

3-30 famous Gon-set converter complete to connect to the P-69-13 or 18-ARS receiver **$39.95**

MOTOROLA P-69-13 or 18-ARS receiver with special noise limiter for use with any converter having 1110-3000 KC. **$60.00**

P-327-E Fire wall loud speaker **$5.00**

The above comes complete with all necessary accessories and mounting hardware. Order direct or through the Motorola National Service Organization member to your area.

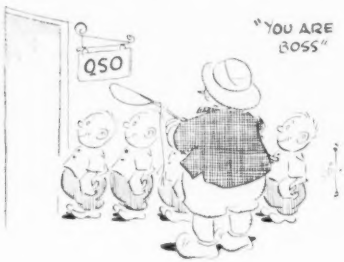
NOTE: *This Receiver and Transmitter is equipment which has been returned from the field, modified and rebuilt for Amateur Service.*

For further information write to:

MOTOROLA INC.
Amateur Sales Dept. QST — September
1327 W. Washington Blvd. Chicago 7, Illinois
Attention: Harry Harrison, W9LLX, Tel Taylor 9-2200 Ext. 161

some fun in good rag-chews. Of course, you can have rag-chews when you first get on the air, if you announce that you plan to rag-chew for ten or fifteen minutes and stick to it. The stations waiting will respect your wish, but they will be watching the clock. However, you will make more operators happy (and speed the day when you can live your own life) by working stations in rapid succession during your early activity. You will find that some stations will call you several weeks or a month after they have worked you the first time, while you are still much sought-after, to ask you if you received their card, or to tell you that a card is on the way to you. After you have established the truth of the preceding sentence by working several of them, it is more desirable to reply only to stations you haven't worked before, so that many stations will have a chance to add your country to their lists.

If you become disgusted with the tactics of some of the Ws you first run into, analyze your own operating. You may find that you have been



at fault, by having answered a call on your own frequency or one that was sent before you had sent your "SK." If such is the case, modify your operating and you will have no trouble. You are truly boss of the situation if you want to be!

50 Mc.

(Continued from page 48)

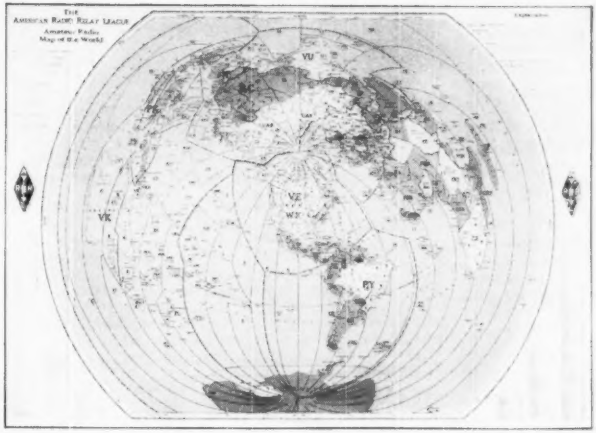
The collinear array can also provide a good answer to the dilemma of the eastern operator who wants to concentrate on horizontal polarization for 2-meter DX attempts, but who hates to pass up the regular activity that is available on vertical. A much better rotary array can be built if one doesn't have to worry about two polarizations.

The World Above 420 Mc.

With feedline losses being what they are at 420 Mc., many of us have given thought to the idea of mounting transmitting gear up in the antenna. This approach is fine for simple oscillator-type rigs, but not many have tried it with multistage jobs. Our friends in Britain have a special incentive in this respect, being limited to 25 watts input on 420. G5BY is using an English tube similar to our AX-9003, running as a straight amplifier, mounted at the top of his tower. Some idea of the advantage in this arrangement can be drawn from field strength indications taken with the amplifier operating at the end of the 35-foot transmission line, and at the top of the tower. With the same operating conditions at each position, the normal set-up

(Continued on page 102)

No Matter Where He Is—Work Him!



PUT UP THE RIGHT ANTENNA

AIM IT WITH THE MAP

As soon as you hear a DX station you can see exactly where he is—because the country prefixes are not just listed in the marginal index; they're printed on the countries, themselves. You can tell his direction from you, and his distance. There's no question about which continent he's in—boundaries of the six continents are plainly marked. 267 countries are clearly outlined.

The time zones are plainly marked, too. Call areas of thirteen countries are shown. Principal cities are designated. There's a scale of miles, another of kilometers. Printed on heavy map paper measuring 40" wide x 30" high, in 8 colors that really stand out, this new ARRL World Map is easily read from your operating position. 267 countries are clearly outlined.

40" x 30" 8-Color Map

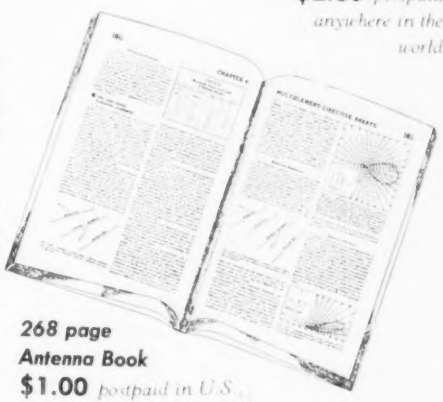
$2.00 *postpaid anywhere in the world*

BUILD IT FROM THE ANTENNA BOOK

A good antenna will take the place of hundreds of watts of power: power of your transmitter, power of the transmitter on the other end of the QSO. It will put your signal where you want it to go and it will bring in the signal you want to hear.

The 268 page Antenna Book with its 831 pictures and diagrams gives full instructions on how to build the antenna you've always wanted. It gives dimensions and shows radiation patterns. It tells how to match the transmission line to it, what you can expect from it.

Whether it's a rotary beam on 20, a 160 meter job in a less-than-80-meter space, a VHF multi-element affair or some other, the antenna you are going to put up is fully described in the ARRL Antenna Book.



268 page Antenna Book

$1.00 *postpaid in U.S., U.S. possessions, Canada $1.25 elsewhere*

All prices in this advertisement are in U.S. funds

THE AMERICAN RADIO RELAY LEAGUE, INC.

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MORE SIGNALS PER DOLLAR
From Money Invested in an Antenna

Self Supporting
STEEL TOWERS
For Rotary Beams, FM, TV

ATTRACTIVE—NO GUY WIRES!

- 4-Post Construction for Greater Strength!
- Galvanized Steel—Will Last A Lifetime!
- SAFE—Ladder to Top Platform
- COMPLETE—Ready to Assemble
- Easy to Erect or Move
- Withstands Heaviest Winds

(We will supply stress diagrams for your building inspector)

Width at Base Equal to 1/5 Height

EASY MONTHLY PAYMENTS
Up to 12 Months to Pay!
All Vesto Towers are available on a special monthly payment plan which requires only 1/3 down. Write for free details.

IMMEDIATE DELIVERY
on all 7 popular sizes. Note the low prices for these quality lifetime towers: 22'-$84.75, 28'-$104.75, 33'-$123.75, 39'-$144.75, 44'-$164.75, 50'-$192.75, 61'-$259.75, 100'-$974.75. Towers are shipped to your home knocked down, FOB Kansas City, Mo., 4th class freight. Prices subject to change . . . so order now! Send check or money order . . . or write for free information.

WRITE TODAY FOR COMPLETE FREE INFORMATION AND PHOTOGRAPHS
The VESTO Company
101 Main St., Parkville, Mo.

BUY OF A LIFETIME!
TRIED AND PROVEN THE WORLD OVER
LETTINE MODEL 240

This beautiful transmitter originally sold for $98. Buy it direct from our factory for only $69.95, complete with instructions for TVI reduction. Even if you already have a transmitter of your own, this rig makes an excellent standby. You can't afford to miss this opportunity.

The 240 is a complete 40 watt Phone-CW rig, working all bands from 160 to 10 meters; complete with (8 x 14 x 8) cabinet, self contained power supply, meter, tubes, crystal and coils for 40 meters. Tube line-up: 6V6 osc., 807 final, 6SJ7 mike amp., 6N7 phase inverter, 2 6L6s mod., 5U4G rect. — weight 30 lbs. — 90 day guarantee. PRICE **$69.95**
$20 deposit with order — the balance C.O.D.
Coils for 80, 20 and 10 meters $2.42 per set. Coils for 160 meters $3.00.

LETTINE RADIO MFG. CO.
62 Berkley St. Valley Stream, N. Y.

gave a reading of 430 μa. The remote amplifier raised this to 605.

Having done an outstanding job on 144 and 220 Mc., W4HHK, Collierville, Tenn., is now trying 420. His receiver is a coaxial-tank mixer using a 1N21A crystal, a 955 oscillator assembly from a BC-645, and a 46-Mc. amplifier stage using a 6AK5, link coupled to an HFS. The HFS is used with its built-in superregenerative detector for oscillator-type signals, or run into an NC-183 for crystal-controlled or otherwise stabilized transmitters. A crystal-controlled 832A tripler is used presently for transmitting.

From Arizona, W7KWO reports on recent 420-Mc. DX-peditions. On July 16th, W7QLZ went to Mingus Mt., 80 miles north of Phoenix, and W7FGG to Mt. Lemmon, near Tucson. Both worked W7KWO, Phoenix, 80 and 105 miles, respectively, on 144 Mc., and all hands went to 420. The 80-mile hop, W7KWO to W7QLZ/7, was made easily on 420, but W7FGG lost his 420-Mc. beam in high winds. The following Sunday W7FGG tried again, with W7QLZ/7 at Yarnell Hill. This latter location proved to be a poor one, but W7FGG/7 and W7KWO worked the 105-mile hop from Mt. Lemmon to Tucson with S9-plus signals on 420. More tests are in the offing, and the boys feel that much greater distances can be covered, as the 420-Mc. signals have been unexpectedly good. Anyone interested in cooperating in future efforts along this line should communicate with W7KWO.

I. A. R. U. News

(Continued from page 49)

QSL BUREAU CHANGES

The last complete listing of foreign QSL bureaus was contained on page 49 of June, 1950, *QST*. The following changes to that list are noted:

Austria: QSL Bureau (U. S. Occupation Forces), APO 777A-% Postmaster, New York, N. Y.
China: M. T. Young, P.O. Box 34, Taichung, Formosa
Cyprus: MD7XP, P.O. Box 451, Nicosia
France: R. E. F., 72, Rue Marceau Montreuil (Seine)
Indonesia: P.A.R.I., P.O. Box 222, Surabaja, Java
Luxembourg: LX1AB, 40 rue Trevires, Luxembourg
Malta: R. F. Galea, 20, Collegiate Street, Birkirkara
Pakistan: P.O. Box 416, Lahore
Roumania: A.R.E.R., P.O. Box 95, Bucharest
Southern Rhodesia: R.S.S.R., Box 1068, Bulawayo
Trieste: MF2AA, Major M. H. R. Carragher, HQ V. G. Police

AUSTRIA

U. S. occupation personnel in Austria have been granted licensing privileges, according to John E. Stanis, OE13AA/W7TKI. Of the fifteen licenses granted, five stations are on the air, operating mainly on 20 meters.

The OE13 stations are permitted to operate between 3500 and 3800 kc., 14,150–14,400 kc., and 28,100–28,700 kc. Rules are similar to those for the DL4s. Why the prefix 13? Mr. Stanis says it was selected by the Signal Officer to prevent confusion with the yet-to-be-legalized Austrian national stations which use the prefixes OE1–OE9.

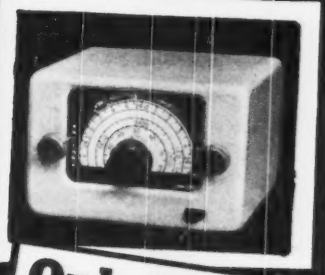
TANGIER ZONE

After many years of no radio regulation, the local administration has brought out a law governing the establishment of radio stations. A stipulation of the new law is that stations must pay a registration fee equivalent to approximately $140. No distinction was made between amateur and commercial stations, and attempts by the Tangier Amateur Radio Club to get this restriction eliminated for amateur stations has

(Continued on page 104)

HARRISON IS GONSET HEADQUARTERS!

FEATURING THE NEW! SUPER-BANDSPREAD TRI-BAND CONVERTER



THE ULTIMATE IN MOBILE RECEPTION ON 10-11, 20, AND 75 METER PHONE!

- **Low noise, high gain RF stage for "big receiver" sensitivity!**
- **High stability oscillator for minimum frequency drift!**
- **Over eight linear inches of bandspread of 10-meter band! (Five complete revolutions of large tuning knob!) Proportionately wide spread of 11, 20 and 75 meter bands! Covers 15 MC SWL band for good daytime BC reception in isolated areas.**
- **Edge illumination, plus color band, insures maximum dial readability. Calibration accuracy better than 1/10 of 1%!!**
- **Adjustable antenna trimmer for signal peaking.**
- **Four tubes: 6CB6-RF Amplifier, 6BH6-High Gain IF, 6AT6-Low Noise Triode Mixer, and 6C4-Clapp Type Oscillator.**
- **Same size cabinet as famous 10-11 and 3-30 Gonsets.**

Finest multi-band converter available for amateur mobile use. Also FB for use with any ham or BC receiver for "hot", dual conversion. 10, 20, or 75 meter reception!

New Gonset Tri-Band Converter — $42.50

Send $42.50 with your order and we'll rush your new TRI-BAND to you by fastest special handling, special delivery, PREPAID!!! All Gonset orders speeded out within one-hour after receipt!

Only $19.95

. . . and your old 10-11, 3-30, or 20 meter Gonset will bring you a brand new TRI-BAND!!

No Strings to This Offer!

If yours is complete and unaltered, (cabinet can have holes, etc.), just send it in with $19.95 (plus 6 pounds postage) and your new TRI-BAND will be on its way to you within ONE HOUR!

If yours is the 6, old 10, 6-15, (or completely "dead" 10-11, 3-30, or 20 meter) Gonset — send only $24.95.

This SENSATIONAL offer good for a limited time only! Hurry! Rush your order TODAY!!

IF IT'S GONSET—HARRISON HAS IT!

NEW! Universal steering post mount for all Gonsets	$3.50
Latest model Gonset Noise Clipper. A must!	$8.25
Continuous Coverage, 3 to 30 MC Converter	$39.95
Famous 6, 10-11, 15, or 20 meter Converters	$39.95
SPECIAL! Reliable "100%-r" Peak Modulation Indicator. Regular net price $19.95. While a few last — Only	$9.95

AUTOMATIC KEY SUPER VALUE!

Buy a precision-built "bug" for a fraction of the original price! Lots of desirable features! Dual Ratio for varying speeds — Positive contact alinement at all times — Super-flexible vibrator for feather-touch operation (Makes unbroken string of dots up to 20 seconds) — Noiseless weight stop — Underslung handle — Heavy base. A terrific buy for old timer or beginner.

Very Limited Quantity — Only $4.95

BUYS IN MOBILE GEAR

SUBRACO MT-15X Favorite 10-Meter Xmtr	Only $79.95
STANCOR ST-203A Kit — $44.70	Factory wired — $58.90
HARVEY-WELLS Bandmaster Sr. 8-Band Fone Xmtr	$111.50
Six volt DC vibrator supply for above. VPS-50	$29.75
LYSCO 10-Meter Mobile Xmtr — $23.95	75-Meter — $23.95
PREMAX new RS Universal Spring Mount. Beauty!	$10.50
96" Stainless Steel Whip for above mount	$2.96
MASTER MOBILE Model 132 Universal Body Mount	$7.95
96" Tapered Stainless Whip for above mount	$4.65
Center-loaded whips for 20, 40, or 75. Specify	$7.95

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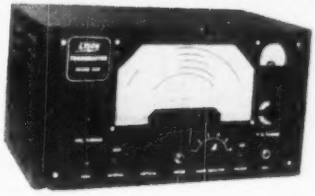
ONLY HARRISON HAS THE DE-TVI'ED VIKING!

Here's America's newest fine quality transmitter, completely laboratory wired and tested, and incorporating TVI preventive measures. Conservatively operated 4D32 final amplifier delivers 100 Watts phone or 125 Watts CW OUTPUT! Push-pull 807 modulators! Completely band switching — 160-80-40-20-15-11-10 meters — optimum final tank Q on all bands — oscillator keying for break-in CW — low impedance coaxial output — provision for VFO — xtal selector for 10 frequencies — dual power supply — all circuits metered. Entirely self-contained in desk cabinet, 11" x 15" x 21" wide. Supplied complete with tubes and instruction book — ready to operate!

Johnson Viking I
Wired, tested, complete! **Only $298.50**

Standard Viking I Kit, as supplied by the factory. Complete with instructions, less tubes $209.50

LYSCO'S TVI-LESS VFO TRANSMITTER



CQ's Editor reports on the Lysco 600 Transmitter in the August CQ! Be sure to read this interesting article. You'll agree that the Lysco Transmasters are excellent buys! Equally popular as complete xmtr or driver for high power final.

TVI Suppressed Transmaster Model 600 — $119.95
Same — No TVI Suppression Model 500 — $109.95
Lysco MOD-20 Matching Modulator for either above $39.95
(Send for literature including schematic diagram)

AMAZING BEAM BARGAIN!!!

Famous Premax three-element, 10-meter beam with aluminum dual boom, fully adjustable seamless dural elements, T-match, all hardware and instructions. All elements insulated—not a plumber's delight. Feed with coax, twinlead or open line. Makes DX hunting a cinch! List price was $50.00

Premax RB-6309, 3-Element Beam SPECIAL! $24.95

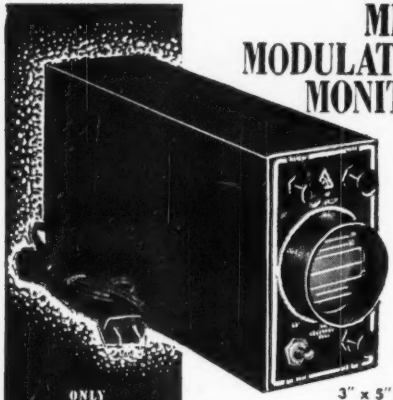
BC-221 AC POWER SUPPLY KIT

Regulated power supply kit for BC-221 frequency meter. All new standard parts (Thordarson, C-D, Ohmite, etc.), including chassis, line cord and complete instructions. Nothing more to buy. Fits snugly into battery compartment of BC-221. Complete kit less tubes. Item MX 221 $9.95

Kit of two tubes (VR tube and rectifier) $1.49

WANT TO PICK UP A BARGAIN IN A USED GONSET? SEND FOR LIST!

HARRISON
NEW YORK 7, N.Y.
225 GREENWICH STREET
(10 West Broadway, at Barclay St.)



MM-2
MODULATION
MONITOR

3" x 5" x 10"

ONLY
$24.95
COMPLETE WITH TUBES
REVERSIBLE PANEL-CALIBRATED
TRACE-INTENSIFIER-WINDOW
INSTRUCTION BOOK

ADD SIGHT TO YOUR SOUND

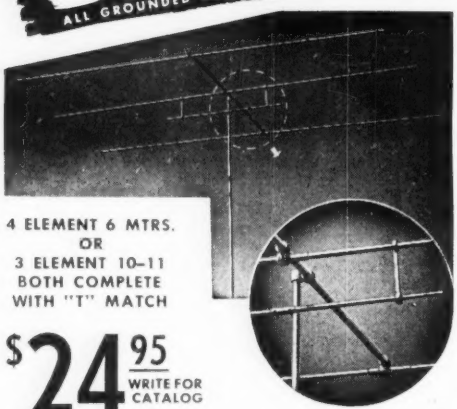
with this basic oscilloscope featuring calibrated modulation percentage scale, linear 60 cy sweep with return trace blanking, trace intensifier window, complete controls, reversible panel, rack mounting provisions and many other outstanding features. See the MM-2 at your dealer or write Dept. 9.

NOW—ALSO AVAILABLE IN
COMPLETE KIT FORM
FOR ONLY $14.95

Send for Descriptive Literature

LAMBDA ELECTRONICS CORP.
BOX No. 55 CORONA, N.Y.

HY-LITE'S NEW
SKY-LITE
ALL GROUNDED ARRAY FOR 10-11 METERS



4 ELEMENT 6 MTRS.
OR
3 ELEMENT 10–11
BOTH COMPLETE
WITH "T" MATCH

$24.95
WRITE FOR
CATALOG
Q-9

HY-LITE Antennae INC.
Makers of Fine Antennas for AMATEUR · FM · TELEVISION
242 EAST 137TH ST., NEW YORK 51, N. Y.

met with failure. Police action has been taken against several club members, according to John E. Terry, EK1DI, president of the group. The club is still attempting to obtain a more equitable set of regulations.

SWEDEN

Sveriges Sandareamatorer will award a certificate to any amateur who can submit QSL cards confirming postwar two-way contact with each of the seven SM districts. European stations must submit two cards for each district. Send QSLs to S.S.A., Postgirokonto 52277, Stockholm 4, together with 10 international reply coupons.

ROUMANIA

Roumanian amateurs are now grouped together in the "Short Wave Association of the Roumanian People's Republic." Licensed by the Administration of Posts and Telecommunications, YO amateurs may use up to 50 watts output on 160, 80, 20, 15, 10, 6, and 5 meters and the higher frequencies, utilizing both radiotelephone and telegraph. Three types of licenses are issued in Roumania based on power output.

DX Contest

(*Continued from page 56*)

San Marino

IISN/M1	6328-14-152-A-12

Sardinia

IS1AHK	77,800-40-663-A-44
IS1FIC	246-6-14-A-1
IS1BLG	18-2-3-A-1

Scotland

GM6IZ	75,988-44-576-B-63
GM3ACD	67,070-38-599-A-60
GM8MJ	59,220-47-420-A-28

Spain

EA1AB	105,436-43-826-A-50
EA1BC	74,760-40-623-A-43
EA3FL	24,395-17-485-B- -

Sweden

SM5AUP	88,312-38-784-B-71
SM5KX	78,936-39-681-B-81
SM3HC	72,579-39-626-B-47
SM2OS	60,040-40-503-B-50
SM5PV	46,956-39-403-B-48
SM5UU	25,632-36-240-B-72
SM5CV	16,484-26-214-B-41
SM5HT	14,476-28-178-A-30
SM5WI	11,718-31-128-A- -
SM7UT	10,080-28-120-B- -
SM3ANG	5742-22-85-B-12
SM5IZ	2926-14-70-A- -
SM5OL	2790-15-63-A-9
SM5AYC	450-10-15-A-1
SM5AWP	285-5-19-B-4
SM7ACO	48-4-4-A-2
SM3ARE	24-2-4-A-1
SM5PV	6-1-2-A-1

Switzerland

HB9EU	138,966-53-880-B-76
HB9BJ	72,283-41-594-A-51
HB9BX	20,592-36-195-A-13
HB9CI	2072-14-51-A-12

Trieste

IIBCB Trieste	3232-16-70-A-20
AC2AG	1861-9-72-A-33

Wales

GW3ZV	357,186-59-2018-B- -
GW5SL	173,362-58-1006-B-67
GW3JI	132,650-50-885-A-75

NORTH AMERICA

Alaska

KL7PB	187,426-62-1013-B-43
KL7AEB	60-4-5- - -
KL7AEA	48-4-4- - -

Bahama Islands

VP1NN (W2COK W8ASH)	61,233-27-795-A- -

Barbados

VP6SJ	86,498-61-481-A-30

Canal Zone

KZ5PA	247,401-77-1071-A-64
KZ5CO	22,134-34-220-A-21
KZ5BK	11,856-16-250-B- -

Cayman Islands

VP5BD	351-9-13-A- -

Cuba

CM6NF	12,000-25-164-A-11
CO2DZ	27-3-3-B- -

Mexico

XF1A	726,530-97-2500-C-90
XE2N	139,239-91-510-B-6
XE1FE	3930-10-133-B-9
XE2OK	1800-12-50-B- -

Puerto Rico

KP4JE	193,275-51-679-B-30
KP4QZ (W8UW)	41,022-43-318-B- -

Salvador

YS2RC	2442-11-74-A-16
YS1O	1908-9-72-A- -

Swan Island

KS4AC	176,448-64-928-A-35

Turks and Caicos

VP5BF	75,929-10-647-A-35

Virgin Islands

KV4AA	691,782-91-2541-B-30

OCEANIA

Australia

VK2EO	290,390-71-1364-A-61
VK2GW	100,488-53-632-A-56
VK5PM	88,176-44-668-A- -
VK2RA	27,900-50-186-A-11
VK3PL	5376-16-113-A-15
VK5RO	4788-12-133-A-7
VK2AM	924-11-28-A- -
VK5KO	872-8-37-A-3
VK3XB	550-11-17-A-11

Fiji Islands

VR2AS	3345-15-75-A- -

French Oceania

FO8AC	5436-12-152- - -

(*Continued on page 108*)

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presents the NEW SYNABAR unidirectional cardioid crystal microphone

DR-10
List Price $37.25
DR-10-S*
List Price $39.95
*With off-on switch

Astatic's NEW SYNABAR MICROPHONE offers a new measure of clear-toned performance quality . . . and its perfection does not diminish through long service life, thanks to a new ruggedness of construction. Perhaps the outstanding engineering achievement incorporated in this newly perfected unit is the use of a special sintered metal to cancel out 15 db front to back, making the Synabar, for practical purposes, dead to sound from the rear. Excellent frequency range, from 50 to 10,000 c.p.s., is further enhanced by a Response Selector switch, which provides choice of ideal pick-up characteristics for either crisp voice or general voice and music. The Synabar's crystal element has a special METALSEAL protection against moisture or dryness. A high impedance microphone, it has an output level of — 54 db. It has a satin chrome finish, is furnished with detachable concentric cable connector and 20 feet of single conductor shielded cable, and is available in models with or without off-on switch.

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Astatic Crystal Devices manufactured under Brush Development Co. patents

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Claims and counterclaims of quality are easy to make . . . but to the engineer, **tests really talk.** And indisputable evidence of Peerless Transformer superiority is found in the **Square Wave Test** . . . which reveals the slightest flaw in design and performance. Tests conducted by impartial engineers prove Peerless components have better power characteristics, flatter response curves, less intermodulation distortion and lower insertion losses. Send for the complete Peerless Catalog . . . giving full details on transformers that are really "best by test."

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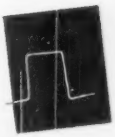

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COILS. AR-2 and AR-5 h.f. coils are high-Q permeability-tuned RF coils on low-loss molded bakelite forms. AR-2 coil tunes from 75 mc. to 220 mc. with capacities from 100 to 10 mmfd. AR-5 coil tunes from 37 mc. to 110 mc. with capacities from 100 to 10 mmfd. Other windings may be substituted to modify range.

COIL FORMS. Molded of mica-filled bakelite permitting grooving and drilling. XR-50 (1 1/16" long, 1/2" dia. form; 1/2" long, 3/8" dia. iron slug) may be wound as desired to provide a permeability-tuned h.f. coil. XR-4 (1 1/2" long, 1" dia.) is standard four-prong form. XR-6 (2 1/4" long, 1 1/2" dia.) is six-prong form for use with special National XC-6C socket. Other types include XR-1 with four prongs, XR-2 and XR-3 without prongs.

National

EST. 1914

NATIONAL COMPANY, Inc.

MALDEN, MASSACHUSETTS

	Hawaii	
KH6LJ	517,824-97-1934-C-64	
KH6MG	359,240-79-1531-C-62	
KH6OJ	14,994-17-294-A- -	
KH6PM	621- 9- 23-A- -	
	Java	
PK3LC	27,468-36- 255-A- -	
	Marianas	
W6VKH/KG6	15,741-27- 197-B-13	
	Marshall Islands	
KX6BA	131,089-61- 718-B-33	
	Midway Island	
KP6AB/KM6	4800-12- 134-A- -	
	New Caledonia	
FK8AB	648- 8- 27-A- -	
	New Zealand	
ZL1BY	321,399-67-1615-A- -	
ZL1MB	289,620-60-1559-A- -	
ZL1MQ	75,372-44- 571-A-41	
ZL3AB	69,144-43- 539-A-30	
ZL2JZ	1680-10- 57-A- -	
	Sumatra	
PK4DA	52,650-39- 450-A- -	
	Tonga Islands	
VR5PL	4320-12- 120-B- -	

	SO. AMERICA	
	Argentina	
LU3EL	121,000-50- 803-E- -	
LU3EQ	1242- 9- 46-B- -	
LU7CW	999- 9- 37-B- -	
	Bolivia	
CP1AQ	11,655-21- 186-A-11	
	Brazil	
PY2AJ	231,240-69-1005-B-53	
PY1GJ	81,759-57- 495-B-60	
PY1AR	273- 7- 13-A- -	
	Chile	
CE3DZ	296,140-67-1474-B-53	
CE2DY	183,395-61-1010-B-49	
CE3AX	107,016-56- 637-B-29	
	Columbia	
HK6JH	720-10- 26-A- 2	
	Ecuador	
HC1PK	259,360-74-1220-B-66	
	Honduras	
HR2HZ	8400-16- 177-A-22	
	Peru	
OA4BR	43,980-30- 491-A-26	
OA1E	19,952-29- 230-A- -	
OA4DX	15,893-23- 232-A-22	
	Uruguay	
CX6AD	6903-13- 177-A- -	
CX1AC	3796-13- 100-A- -	

[1] Operated by W3GHS. [2] Operated by W4KVM. [3] Operated by W9LVR. [4] Operated by W6BBR.

Correspondence

(*Continued from page 57*)

a gadget that may prove to be a boon to his fellow-hams or to the manufacturer of radio equipment.

Then why shouldn't he deserve more recognition from our government and the general public at large? I have run into amateurs who have most kinds of professions — doctor, lawyer, minister, groceryman, etc. — but have never yet met one who said he was a politician. That's it: politicians, and a lot of them, are what we need in our ranks. They seem to be able to get votes by getting bills put through to their best advantages. Hi! . . .

— *John G. Hunt, W8QIE*

Strays

Very-low-frequency radio signals traveling completely around the world have now been detected by researchers at the National Bureau of Standards. The signals, transmitted from Naval Radio Station NSS at Annapolis, on a frequency of 18 kilocycles with a power of 350 kilowatts, were received at the National Bureau of Standards radio-propagation field station at Sterling, Va., about 50 miles away. Normal delay time for a round-the-world signal was more than a tenth of a second, and maximum signal intensity was observed at sunset.

The signals were received, with the aid of a large loop antenna 150 feet high, on a tuned-radio-frequency receiver. A dual-beam oscilloscope was connected ahead of the detector stage in the receiver so that the actual unrectified r.f. envelope was displayed on the 5-inch screen along with an 18-kc. reference voltage. The delay time was measured by making a moving film record of the oscilloscope screen.

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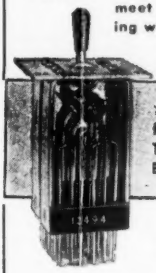
meet your needs for multi-circuit switching where a combination of quick break and low blade-to-blade apacitance is required!



★For Making, Breaking, or Transferring Multiple Circuits in Radio, Television, P.A., Sound Recording Equipment.

Illustrated: New Federal Anti-Capacity 8 pole Double Throw Switch

The quick break feature of these Federal switches combined with the silver plated phosphor bronze blades and silver contacts make it possible to break high frequency A.C. as well as the A.C. and D.C. circuits usually encountered in sound, radio, radar, and test equipment. Can be easily adjusted for make-before-break, or break-before-make. Approved and used by the U. S. Navy, Army Signal Corps, and U. S. Forestry Service.

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No. 1426 • 2 P.S.T. (N.C.)
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TEST EQUIPMENT

The present emergency requires putting back into service both military and laboratory quality commercial test equipment. Interested in any TS, I, BC or other good pieces. Critically need TS-34's, TS-100's, TS-174's and any I-208's, plus gear made by Boonton, General Radio, Stoddard, etc. Please communicate giving full nomenclature and serial numbers. Describe condition with your lowest cash price.

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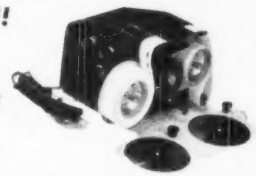

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Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

GARDINER & COMPANY
STRATFORD • NEW JERSEY

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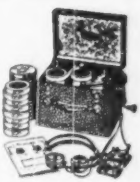
It is easy and pleasant to learn or increase speed the modern way — with an **Instructograph Code Teacher.** Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send to you.



ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the **Instructograph System.** Write today for full particulars and convenient rental plans.

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4709 SHERIDAN ROAD, CHICAGO 40, ILLINOIS

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contact discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

Please note the 7¢ rate on Ham ads is available to ARRL members only.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

QSLs, 100, $1.25 up. Stamp for samples. Grilleth, W3FSW, 1042 Pine Heights Ave., Baltimore 29, Md.

QSL's, SWL's. Finest stock. Fairest prices. Faster service. Dossett, W9BHV QSL Factory, 855 Burlington, Frankfort, Ind.

QSLS! Kromkote cards at a fair price. Dauphinee, W1KMP, Box 249, Cambridge 39, Mass.

SUBSCRIPTIONS. Radio publications a specialty. Earl Mead, Huntley, Montana, W7LCM.

QSL's high quality, fair prices. Samples? W7GPP, R. D. Dawson, 1308 E. Street, The Dalles, Oregon.

10 METER Beams, $19.50. Send Card for free information. Riverside Tool Co., Box 87, Riverside, Illinois.

CRYSTALS: Bassett Type 100A precision low-drift units made to your exact specified frequency within the 80 or 40 or 20 amateur bands, at $1.5C each, plus postage. Rex Bassett, Inc., Bassett Building, Ft. Lauderdale, Fla.

ZIPPO lighter. ARRL insignia and call sign, inlaid enamel, $5.90. Ideal birthday gift. McCarron, W2BXO, 484 E. 193 St., New York 58, N. Y.

WANTED: Marconi magnetic detector, multiple tuner, DeForest responder and audion control panels; other wireless gear prior to 925. Franklin Wingard, Rock Island, Illinois.

QSLS. Very attractive. Best in printing and prices. Kromekote or any other stocks. Stamp for samples. W4LXI, Roop, Radford, Va.

FOR Sale: BC-312D, converted, $45.00; BC-224H, converted, $45.00. Both units in good condition, ready to go. Also SCR-522, $20.00 and BC-348R, $45.00. Unconverted. Both units complete with tubes and in good condition. Clement Gonveia, 3310 63rd St., Sacramento, Calif.

WANTED: APR-4 receiver and tuning units. State condition and price. W2DB, 274 Boulevard, Searsdale, N. Y.

QSLS. Uncle Fred QSLs. Three colors and up. Rainbow map QSLs. Special DX QSLs. Bargain QSLs. Samples? Uncle Fred, Box 86, Lynn, Penna.

ARE you or a friend going to try for an amateur radio operator's license? Check yourself with a complete-coverage multiple choice test similar to those used by the F.C.C. Class B & C test, $1.75. Class A test, $2.00. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

1000 VA transformer 1100-2200-4400 each side C.T. Guaranteed. Dawson, 5740 Woodrow, Detroit 10, Mich. $15.00.

PHONE patch schematic, practical discussion. $1.00. Nichols, W1MRK.

FULLY amplitude modulate any tetrode or pentode to maximum ratings with three watts audio. No transformers, excellent quality. Duo-controlled carrier modulation. Details, $1.00. R. Best, W4JGA, Greensboro, N. C.

ADVERTISED complete: For sale complete radio broadcasting studio equipment including G.E. Model TR-1-A FM transmitter and Truscon steel 165 ft. tower. Best offer takes all. Tiffin Savings Bank, Tiffin, Ohio.

QSLS? SWLS? Modernistic? Rainbow? Cartoons? Photographic? QSL specialists? Samples 5¢. Sakkers, W8DED, Holland, Michigan. QSLs unbeatable!

QSL'S, SWL's. Meade, WØKXL, 1507 Central Ave., Kansas City, Kansas.

ATTENTION New York City hams. Selling: Meissner 150-B transmitter, VFO controlled, with coils for 80, 40, 20 and 10 meters; and 2E26 doubler. Some spare tubes. $175.00. 3-element wide-spaced 10-meter beam with T-match. Very sturdy. 25 ft. mast included, $30.00. Super Pro (BC-779) with speaker and power supply, $125.00. 10-11 meter converter in cabinet, $15.00. All units in good operating condition. Will not ship any units. William Versaci, W2UQD, 81-25 Gorsline St., Elmhurst, Long Island, New York. Phone: IR 4-4968.

ESTATE W1AEC: All in excellent condition. Postwar HT-9 xmitter 80-40-20-10 coils, four 814's, D104 with grip to talk mike stand, BC-458 (5.3-7 Mc.); BC-459 (7-9.1 Mc.); RME-45 with 8" speaker, VHF152-A, BC-348-Q converted with AC supply and speaker. Deluxe Vibroplex chrome bug, 4-element 10-meter beam, prop pitch rotator, Selsyns, phone patch, Simpson model 240 Hammeter, plus many tubes, meters, relays and small parts. Send for complete list. All inquiries answered. Best offers accepted. Mrs. Kenneth Dyer, 85 Laurel Street, Fairhaven, Mass.

BARGAINS: New and used transmitters-receivers-parts: Globe King, $299.00; HT-9, $225.00; Temco 75A, $250.00; Sonar SRT-75, $139.00; ART-13, $129.00; Collins 75A1, $325.00; new 150-watt phone, $199.00; HT-6, $85.00; 60-watt phone, $89.00; Globe Trotter, $57.50; new Bud VFO, $39.50; new Meissner signal calibrators, $29.95; HRO complete, $129.00; SX-43, $129.00; NC-173, HQ-129X, $139.00; RME-45, $99.00; SX-25, $89.00; RME-69, $69.50; S-38, $29.95; VHF152A, BC-610's and many others. Large stock trade-ins. Free trial. Terms are financed by Leo, WØCP. Write for catalog and the best deal to World Radio Laboratories, 740-44 West B'way, Council Bluffs, Iowa.

MOTOROLA dispatchers, new, $350.00. Used: $250.00. W5BCO, Hicks, 204 E. Fairview, Tulsa, Okla.

QSL'S SWL's. For quality workmanship C. Fritz, 1215 Briargate, Joliet, Ill.

WANTED: 1 or 1½ WK, AC 110-120 volt 60-cycle generator. Belt drive. Also modulation transformer Thordardson T-14M49. State condition and price in first communication. E. Nettelton, Box 67, Port Aransas, Texas.

1N34 Crystal, 67¢. BC-456 modulator, less tubes dynamotor. As is, 98¢. Free "Tabogram". Amazing bargains. "TAB", 109 Liberty St., New York, N. Y.

SELL: Complete outfit, due to death. Hallicrafters, Skyrider Defiant high frequency receiver, SX-24; Speaker; Telephone-telegraph transmitter HT-6, 25 watts. Also Astatic microphone D104 A 100658; Beede oscillator. Antenna tuning. Plus: miscellaneous equipment. $250.00. William Hayward, 10 Westbridge Drive, Babylon, L. I., N. Y.

SELL unused, perfect: SX-24 with matched speaker, new 6-tube broadcast receiver in sealed carton, complete with battery supply, $17.00; heavy duty prop pitch motor, wired 7" Telekit receiver, complete with 12" tubes. Bargain 1BBP4, 80's. Want: tube 32V2 transmitter or good camera. W2PUK, Zambakian, 79 Sunset, Glen Ridge, N. J.

SELLING out: NC-240D, less speaker, 6 months old, $175.00; Johnson Viking xmitter, 150 W. fone c.w., all tubes, microphone, Vibroplex original, wired and tested by Johnson factory: $225.00. Either or both F.o.b. Jonesboro, Arkansas. W5MSH, Whitsitt, 1866 S. Main, Jonesboro, Ark.

SELL or swap: Amertran 6200 volt 700 Ma. plate transformer, KW coils and 810 tubes with sockets; Gon-Set 10-11 converter. Swap Zenith Transoceanic portable for small communications receiver. WØGZL, Box 425, Salida, Colorado.

WANT to buy ham receiver A-1 condition. No junk. $75.00 top price. F. W. Janowiak, 1210-18th St., Bay City, Michigan.

BC-221T. Brand new, never saw service in Army or elsewhere. Reasonably priced. Call Pr 8-6804. T. Diers, 58-84th St., Elmhurst, L. I., NYC., N. Y.

SELL: BC-348-P, bought new, converted AC, instruction manual, $60.00. Fred Kiefer, W3LVT, 5644 N. Uber, Phila., Penna.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Gon-Set, etc. Reconditioned S-38, $25.00; S-40A, $59.00; SX-25, $69.00; NC-57, $59.00; NC-173, $139.00; NC-183, $179.00; HRO7, $199.00; RME-84, $59.00; RME-45, $89.00; HQ-129X, $119.00; Meck T-60, $79.00; BC-221, $49.00; Meissner Bandswitching VFO, $49.00; S22R, SX-43, SX-42, SX-62, S-39, SX-28, SX-28A, HT-18, HT-9, HF-10-20, VHF152A, NC100, HFS, NC-240D, NC-46, BC-610, 32V, 75A, others. Shipped on trial. Terms. List free. Henry Radio, Butler, Mo.

SALE: BC-348 electrically and mechanically perfect, completely converted. Write for details. Walter Berke, 378 Alphonse St., Rochester 21, New York W2OZB.

SELL: Original cartons, never used: Sonar XE-10 NFM exciter, Amphenol 40-meter folded dipole antenna. What am I offered? W3KB, 214 Runnymede, Jenkintown, Penna.

NEW BC-222 transceiver. 27-54 Mc. Complete with batteries, mike earphones, antenna, crystal and extra tubes: $45.00. ARC-4 transceiver, $10.00. R. Van Wuyckhuyse, W2CR, 412 Humboldt St., Rochester, N. Y.

SELLING: WIMRQ, 400-watt cw/'phone 160 to 10 meters, VFO control, 813 final, 813's modulators, 6½ ft. rack. All parts oversize, $300.00. Hear on 75 'phone. NC-101X recently overhauled by National $75.00. Will deliver 100 miles Boston. BC-654A, 80-meter, VFO, 'phone bk in code, PE-103, PE-104, $35.00. Pole transformer 110/220 to 2200-3 Kw., uncased, $25.00. Hundreds of small parts. W1MRQ, Groveland, Mass., phone Haverhill 3-3092.

FOR Sale: HT-9 coils for 10-20-40-80 meters, $250.00. Would consider late model 5-inch 'scope in trade. Levern Glau, Route One, Sioux City, Iowa.

FOR Sale: ART-13 in good condition, tested on air, not converted, less power supply: $120.00; BC-779 receiver, in excellent cond. with original power supply, less speaker, $120.00; SCR-522 in good, clean, condition, no xtals or pwr supply: $22.00; BC-348P obtained brand new, used less than 50 hours, not converted, $70.00. W. M. Mead, Box 672, Chico, Texas.

SELL: Collins 75-A1 receiver, in excellent condition: $250.00. George Tate, W4AIS, Box 1499, Greenville, S. C.

QSL's: Have you seen them yet? Samples today, your best bet! Larry's QSL's, Opportunity, Washington. P.O. Box 59.

SELL: Postwar Super Pro SP 400SX; in excellent condition; $250.00 F.o.b. Kansas City. James Fernane, W0JO,* c/o F.C.C., 3200 Fidelity Building, Kansas City 6E, Missouri.

WANTED: Wireless Specialty 1P76 Tuner, Marconi 106 tuner, Vol. 1 Collins Wireless Bulletin, Clapp-Eastham Type D receiving transformer, Blitzen receiving transformer, Murdock moulded transmitting sections; Wireless Operator's Pocket Book, by L. W. Bishop. Electrical Experimenter magazines. Have for trade: QST 1915 to 1950. Louis Rizoh, W1AAT, 100 Bay View, Salem, Mass.

QSL'S! TA'sgrint, Sumrall, Mississippi.

NEW Crystals for all commercial services at economical prices, also regrinding Motorola, Link, G.E. and other commercial crystals. Over fourteen years of satisfaction and fast service! Edson Electronic Company, 1802 North Third, Temple, Texas. Phone 3901.

QSL-SWL cards! Samples free. Cushing, W1HJI, Box 32A, Manchester, N. H.

WANTED: Good used Hickok indicating tracometer. W5VE, RFD 11, Box 229, San Antonio, Texas.

FOR Sale: Modified GE 250 watt FM transmitter, Model 4GF1A1 and spare tubes, $100.00. Two 4-250As in final. Can be converted to 6 or 10 meters. W9ANQ, Jorgenson, 217 Hudson St., Eau Claire, Wisconsin.

HROSTAT, in excellent condition: $200.00. TIF 10-20, $55.00. Hallicrafters S-72 portable, 4 months old, $60.00; DB-20 $25.00; also have transmitter using PP 4E27 with 100TH modulators 600 watts which cost me $700 to build in 6 ft. Rud cabinet, sell to nearby ham for $450.00. Reason: moved to smaller quarters. W6KWK, 547 W. Merle Court, San Leandro, Calif.

SELL: TCS-12 new transmitter, receiver, 12V D.C. power supply, cables, instruction book, $225.00. TCS-12 with A.C. power supply, $295.00. Signal generator 1-222-A, $45.00. RA-34 rectifier, $85.00. TBY Technical Manuals, $1.00. T. Howard, 46 Mt. Vernon St., Boston 8, Mass.

RCA 833-A tubes in original cartons, $25.00. Francis Pierson, 9201 Philip, Detroit 24, Michigan.

TRADE BC-348-H for Hi-fidelity speaker, radio like Hallicrafters S-56, test equipment or what? W6ISOI, 216 Hanmer Ave., Corona, Calif.

FOR Sale: Surplus power supply — 1000 volts, 350 Ma and 12 volts at 15 amps, 110 volt, 60 cycle input in steel cabinet with 15 Kv meter on panel. $25.00. Echo Nova BC-454, 5-6 Mc receiver, converted with AC power supply, $10.00. New T-23 ARC-5 VHF rig unconverted complete with tubes (2-1625, 2-832) less shields for 832's only $20.00. R. H. Collins, W4CSC, Christiansburg, Va.

TRADE AN/ART13 Collins transmitter (unconverted) for HQ-129X. Have RCA 5-in. oscilloscope, instructions for first, $50.00. Pair 2A3 speech amplifier, clipper in factory-design chassis with cover, best offer. W5JQD.

FOR Sale: Closing out on first class equipment, like new. Collins 75A1, 1 Kw variable transformer with meter, MM2 micromatch, power supplies, modulator. Beams, 40 ft steel tower, rotator, selsyns. Orval Hanson, W0HBA, Watertown, South Dakota.

FOR Sale: Complete, extras, converted: BC-342N, BC-453B, BC-221C. $140.00 or best for lot. Also separately. W2IDX W., 524 W. 184th St., New York City. LO 8-9422.

SSSC: Matched resistors and condensers for phase shift networks and other specialized components, available. Grady, W2SNQ, 1 Ridgeway Avenue, West Orange, N. J.

TVI proofed 1 Kw transmitter, $550.00. AM-NBFM, C.W.V.F.O. picture available. D. Tolson, 316 Westover, Portolk, Va.

TRADE: SCR-522s, etc. for HRO coils or any reasonable offer. Large quantity surplus. W4PFA.

WANTED: S-37 receiver. Will swap Sonar 680 or VHF-152. David Adlerblum, W2OAI, 14 Caryl Ave., Yonkers, N. Y.

BC-348-Q converted. Purchased new. Original overseas packing; with speaker, instruction book, base, and new auxiliary 6V DC vibrator supply; aligned. $85.00 or best offer. R. O. Endres, Pleasant Valley Avenue, Moorestown, N. J.

SELL: BC-224B 12 volt BC-348 like new. Complete with shock mount. Dynamotor. No wiring changes. $42.50. Want: R9er, beam, beam rotator. Consider a trade. W5MAM, 6240 Clover Ridge, Houston 17, Texas.

BC-221 Frequency meters for sale. Metal cabinets, complete with crystals, tubes, original calibration books, some have spare tubes, all have spare calibration books. $59.00. R. H. Sneed, 643 Eagle Avenue, Jackson, Miss.

SAVE on this fine communications receiver. National NC-81-X, bandspread on 80-40-20-10 with variable crystal filter. Yours for only $35.00. H. Deane Loveland, 407 Fayette St., Belle Vernon, Penna.

ART-13, excellent, untampered condition, tubes and instructions $115.00. 28 V, 15 amp, D.C. supply for above, $45.00. 1200 V. and 400 V. supply for above, $45.00. All F.o.b. Plainfield, N. J. Complete 350-watt 3000 to 18000 Kc type GO-9 bandswitching transmitter. Clapp VFO frequency control. 500 and 1800 volt 110 VAC power supplies, antenna network, meters, control panel, all self-contained. 803 straight final amplifier. Instruction manuals. Over 100 countries on c.w. $95.00. 300 Watt Class B modulator using 4-TC Varimatch, VM4 output and input, also filament transformer and meter. Wired for 813's but matches any tubes. $25.00 F.o.b. Harmon, W2JME, 225 Maple Ave., North Plainfield, N. J.

FOR Sale: HQ-129-X, BC-459-A with power supply and BC-453, Q-5er all in A-1 condition. If you are interested, write W0MLK, 315 Dix Road, Jefferson City, Missouri.

BC-610. Sell top covers, front panels, exciter deck, side handles, brackets, channels, hardware, relays, exciter tuning boxes, meters, switches. Want pairs lower skirts, back covers. Sell new BC-696, racks, used BC-459A, BC-456 modulator, new Mossener Precision Xtal frequency standard. Walt Strasser, W8BLR, 15584 Birwood, Detroit 21, Michigan.

FOR Sale: Millen exciter, T-19/ARC 5(3-4 Mc.), 522 transmitter for 144 Mc. All in good condition. Any reasonable cash offer. W1PQW, 1341 Main, Whalon, Fitchburg, Mass.

10 & 20-meter beams, $19.25 up; aluminum tubing, etc. Willard Radcliff, P.O. Box 547, Fostoria, Ohio.

EUROPEAN Hams are in need of all types of old radio magazines. Help a worthwhile cause. Send to DL4SU.

HAM-MINDED radio parts distributors are few and far between, but one of the best is Evans Radio, 10 Hills Avenue, Concord, N. H.

BARGAINS in used receivers, transmitters, parts. National, Hammarlund, Hallicrafters, RME, Gon-Set, Lysco, etc. Write for lists. Dossett Radio, 855 Burlington, Frankfort, Ind.

FOR Sale: Sonar NBFM exciter, model XE-10 with meter and crystals. Excellent on-the-air reports. Reasonable. Wanted: crystals 8340 to 8440 Kcs. State frequency and price. W1DJV, 38 LaSalle Rd., West Hartford 7, Conn.

WANTED: Tuning unit CRR-47211 9 to 15 Mc. for ATD aircraft transmitter for cash or trade. Have new CRR-47208 to sell or trade. Also need CRR-23280 control unit. D. E. Cartwright, Sr., W8UPB, Ohio, SEC, P.O. Box 82, Lockland, Ohio.

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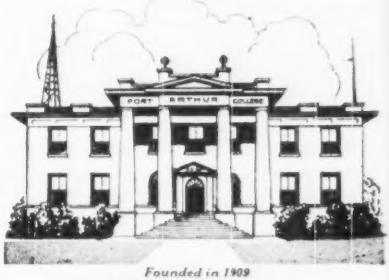

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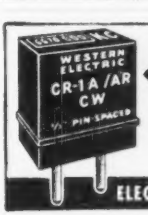

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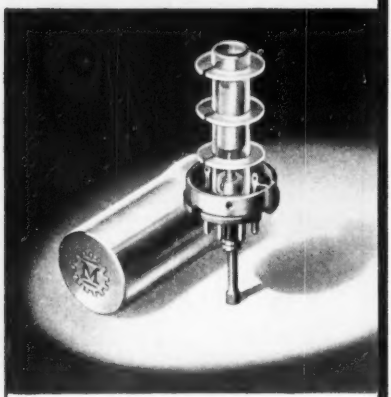

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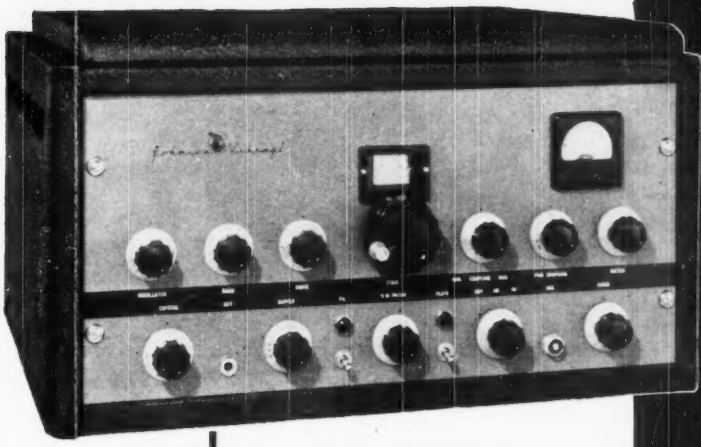

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• Output — 100 watts, with AM phone on all bands, 115 watts cw • Band switching on all bands from front panel — no plug in coils • Continuous tuning final tank—additional inductance switched in for 160 meter band • Pi-section output stage for operating ease, efficiency • Front panel control of ten crystals • Unique Pierce oscillator • VFO input receptacle • Freedom from parasitics • Two complete power supplies • All stages metered • Handsome desk cabinet 11-3/16"x 15"x 21" • 807 modulators, frequency response limited from 300 to 3,000 cycles • Most any antenna can be used without external couplers

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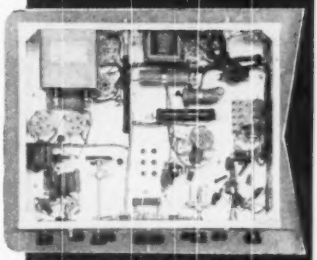

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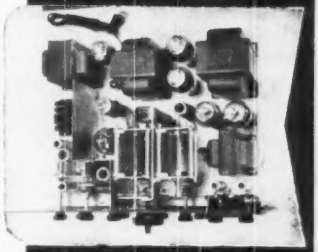

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DC Plate Voltage	1250	1500
DC Grid Voltage	0	−4.5
Peak AF Grid-to-Grid Voltage	175	170
Zero-Signal Plate Current	54	32
Max.-Signal Plate Current	350	313
Driving Power	6	4.4
AF Power Output	310	340

Two RCA 812-A's as Class C Amplifiers	CW	Phone
DC Plate Voltage	1500	1250
DC Grid Voltage	−120	−115
DC Plate Current	346	280
DC Grid Current	60	70
Peak RF Grid-to-Grid Voltage	480	480
Driving Power	13	15.2
Power Output	380	260

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